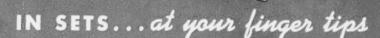
MODERN June, 1949 MOCHINE Shop

when you think of BORING think of BOKUM

The angle of the cutting edge and the special helical backed-off form of the front of the foot (that characterize Styles A and B) produce a free cutting action that is constantly retained—even through resharpening.

Bokum tools are always preferred where precision boring is demanded.

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with any other method.

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We will be glad to furnish a production estimate on your work - send us complete description with prints - no obligation.



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This provides information on all Gorton tracer-controlled machines.

THE JOB IN BRIEF

MATERIAL — Stainless Steel
OPERATION — Profile 20 turbine
blades 1/2" deep from the solid in
c circle 13.155" outside diameter.
FIXTURES — Gorton Rotary Table
and 5 times-size master cut from

and 5 limes and shoot from.

CUTTERS — 2 carbide 2-flute and 2 H.S. Steel 4-flute.

TIME — 10 hours: Finish better than 30 micro inches. Time Saving over any other method 40 hours or better.

MARKS — Tooled for Automatic th production work, the time wid be cut to 4 hours.



1706 RACINE STREET .

RACINE, WISCONSIN, U. S. A



JUNE, 1949

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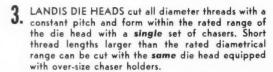
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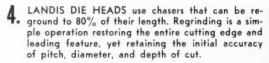
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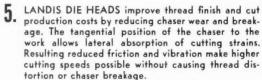
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cut threads BETTER CHEAPER

- LANDIS DIE HEADS cut tool cost by using chasers that are independent units. Worn or damaged chasers are reground or replaced individually, without affecting the remaining chasers of the set.
- 2. LANDIS DIE HEADS reduce tool inventories by cutting both right- and left-hand threads with a single set of chasers. Chasers are ground on both ends, the spring action in the die head is reversed, and either a right-hand or left-hand set of chaser holders is used.





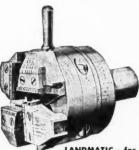


6. LANDIS DIE HEADS consistently produce threads accurate for lead. Regrinding does not destroy the lead controlling feature of the chasers. Thus this feature assures accurate pitch threads throughout the chaser's life.

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LANDEX—for Automatic Screw Machines

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WAYNESBORO .

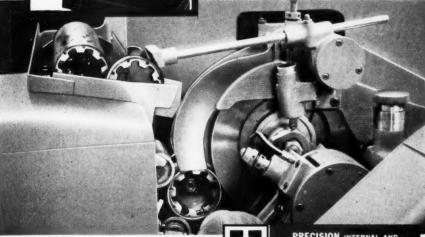
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These cams are precision ground on the fully automatic Model 281 Centerless shown below.

Two Heald Model 281 Centerless Internals are now precision finishing transmission cams 75% faster than by previous methods. The cams are of two types — both ground on the I.D. on one machine. One type, however, has a counterbore on one side, which is ground on the I.D. and face simultaneously on the other Heald Centerless—by means of a backing plate which keeps the work in contact with the face of the wheel until proper depth has been reached.

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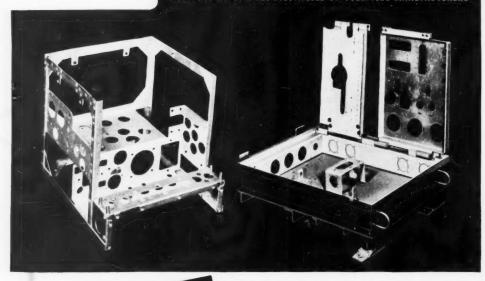
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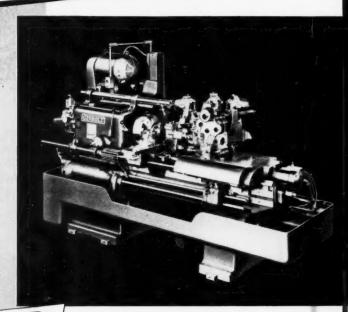
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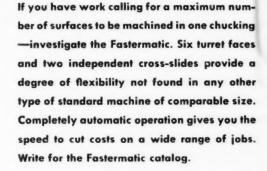
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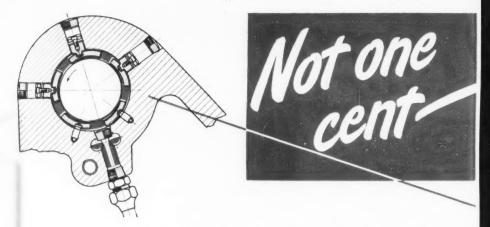
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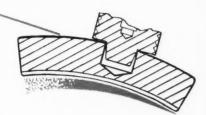
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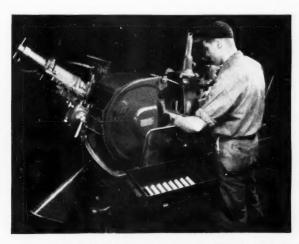
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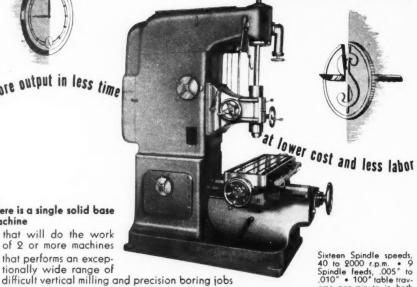
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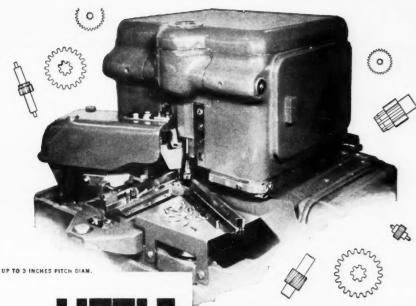
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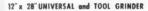
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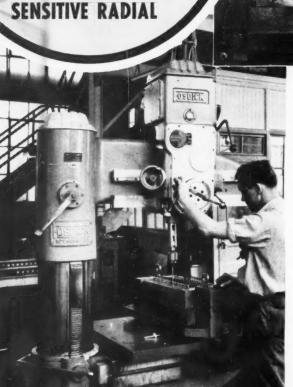
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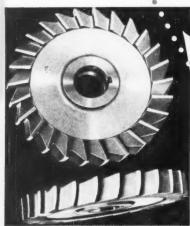
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MACHINE: Cincinnii 3-Spindle Mill.

TOOL SETUP: (1) R. H. and L. H. Shear Side Milling Curter.

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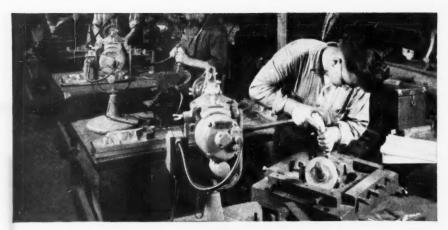
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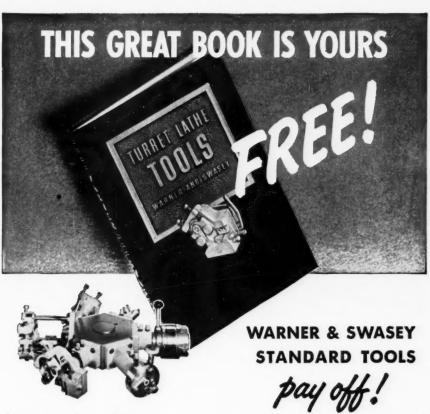
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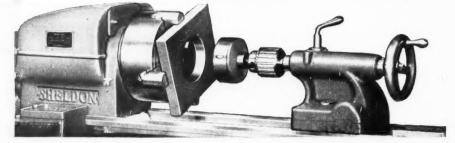


ARMSTRONG-BLUM MFG. CO.

The Hack Saw People'

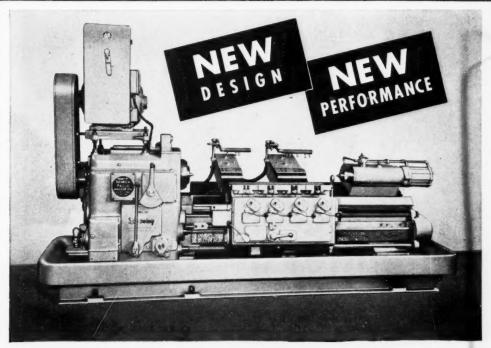
5700 Bloomingdale Avenue

Chicago 39, U. S. A.



MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-owing PEOPLE" SENECA FALLS. NEW YORK



NEW So-swing LATHE OFFERS UNLIMITED CARRIAGE TRAVEL FOR LONG OR SHORT CUTS

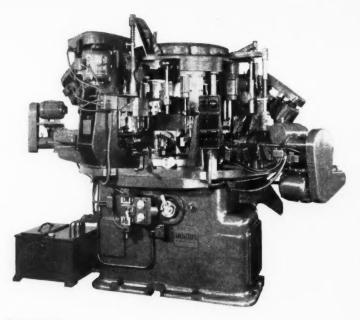
Model AP, Lo-swing's new Semi-Automatic Lathe is designed to fill the demand for a modern, high-speed, multiple-tool turning lathe, which can be set up readily and operated by unskilled labor, and in which maximum carriage travel is provided. It is ideal for shaft work involving long shoulder lengths where overlapping of cuts is not desirable, and equally suited to short run jobs requiring heavy stock removal where limited quantities do not justify set-up time on fully-automatic, closed-cycle machines.

Model AP is rugged in design and heavily constructed throughout to take full advantage of the tremendous cutting capacity of modern sintered carbide tools at high cutting speeds and coarse feeds. Its carriage travel is limited only by bed length and is accomplished through a unique balanced, twin-pinion carriage feed mechanism which cuts the unit pressure on rack and pinion teeth in half. Carriage cross slides are power operated and individually controlled. Hinged-type roller steady rests prevent the work from springing away from the tools. Other features include: Automatic feed throwout coupled with Automatic tool relief; Rapid traverse movements for longitudinal carriage feed and cross slides and for the Automatic Back Attachment.

Investigate the cost-cutting possibilities of the newest Lo-swing Lathe. Write for Bulletin AP-49 today.

SENECA FALLS MACHINE CO., SENECA FALLS, N.Y.

PRODUCTION COSTS ARE LOWER WITH So-swing



MORRIS

MOR-SPEED PRODUCTION
MACHINE

• WE BUILD THE MACHINE TO FIT THE JOB

On this machine the operator merely loads and unloads the work while machine is operating on the piece. All machine functions including the indexing are automatic.

The machine drills—taps—spotfaces—and reams carburetor main bodies on a mass production basis for a prominent automobile concern.

The machine of vertical design has 12 automatic indexing four position fixtures, 20 drilling spindles, 7 facing spindles, 15 tapping spindles, 1 brush spindle and 4 reaming spindles and turns out a complete piece at every index of the turret.

Here is another typical instance of where Morris developed the machine to meet specific job conditions. If you are interested in the high production of work requiring drilling, reaming, tapping, facing and similar operations consult Morris—they have the experience, engineering ability and facilities to help you.





Ariction Cutting

with LENOX
Metal Cutting
Band Saw Blades

Lenox has perfected an outstanding saw for this purpose. Friction cutting with metal band saw blades traveling at tramendously high speeds is ordinarily a melting-burning procedure as distinguished from the conventional slower speed sawing operations.

FOR INFORMATION ON FRICTION CUTTING WITH METAL CUTTING BAND SAW BLADES, WRITE

LENOX

AMERICAN SAW & MFG. CO. SPRINGFIELD 1, MASSACHUSETTS

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Follow the Leaders...

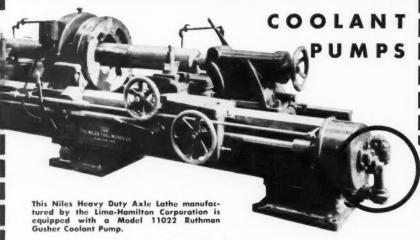


Photo Courtesy The Lima-Hamilton Corporation

The leading machine tool manufacturers all over the country use Ruthman Gusher Coclant Pumps as standard equipment on their machines. They know from experience that the exclusive features built into every Ruthman Gusher Pump give them a pump which will satisfy the most rigid requirements.

You too can be sure of this efficient dependable service when you specify Ruthman Gusher Coolant Pumps on your metal working equipment.

Write for our new catalog today.



THE RUTHMAN MACHINERY CO.

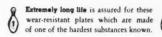
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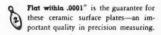
CINCINNATI, OHIO

A TEN STRIKE



The Norton CERAMIC Surface Plate





Permonent flotness is a feature of these ceramic surface plates that will not warp or deform, give expansion troubles or deflect under load.

Smooth surface allows easy movement of instruments and work across plate without drag or vibration but with correct "pull" for accurate measuring by operator.

Non-magnetic nature of this ceramic surface plate permits work to be removed from magnetic chuck and checked without necessity of demagnetizing.

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Ideal for blueing is the special surface texture of these plates. A uniform film is readily transferred from the plate to the work.

Foster, more occurate readings are possible because of the precise flatness and extreme smoothness of these ceramic surface plates.

bases, gage blocks and sine bars because of the flat, smooth surface of these ceramic surface plates.

Easily eleaned with any soap powder and water—and periodic cleaning is recommended.



NORTON COMPANY Worcester 6, Massachusetts



Write for Free Bulletin No. 1174

CERANIC SURFACE PLATES

For Straight Hardening LONG, SLENDER HIGH-SPEED STEEL TOOLS, SPINDLES, BROACHES, REAMERS, ETC.



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Large or long, slender high-speed steel tools, broaches, spindles, etc. are best hardened in the specially designed Sentry Model YP Vertical Electric Furnace, Employs the Sentry Diamond Block Method of Atmospheric Control for maximum quality hardening of molybdenum, tungsten or cobalt high-speed steels. No scale or decarburization.

Finished work is smooth, dimensionally correct and true to shape, saving costly finishing operations.

Sentry Electric Furnaces are made in sizes and capacities to meet your requirements.

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- 1. Available from stock in the largest assortment of sizes—4/A thru Z—and tapers—.013, .008 or .005.
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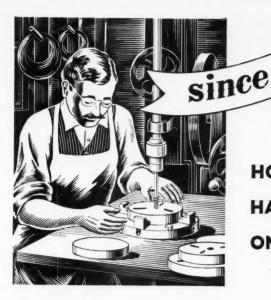
Write for catalog and prices, stating sizes needed and type of work to be done.

Also manufacturers of Helical Taper Pin Reamers, Chucking and Hand Reamers.



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Originators of the Helical Taper Pin Reamer in 1918
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Horton's engineering staff is ready to help solve your special application problems; write today . . . ask Mr. Lynch to send you our new catalog material.

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COOLANT PUMPS



These precision-built pumps really go to town to keep tools and work at just-right temperatures to maintain longer life on tools and exactly-asdesired production.

The really amazing variety of models -catalog or "made-to-order" runs the full range of any requirement. Pipe sizes from 3/8" to 11/2".

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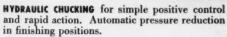


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FLAT CROSS SLIDES AND SWINGING TYPE FORMING ARMS for heavy cuts and wide variety of work.

SPINDLE STOPPING MECHANISM positions spindle automatically in any position. Safety device prevents carrier index before finish of chucking operation.

CARRIER LIFTING, LOCATING AND LOCKING MECHANISMS during index preserve accuracy by eliminating carrier wear and weave.

DOUBLE INDEX of spindle carrier permits finishing both ends or two pieces per cycle.

ACCELERATED OR DECELERATED MOTION, separate from turret, changes feed rate of any end working tool for different operations. Drill speeders in all positions.

ANTI-FRICTION BALL BEARING on hydraulic chucking distributor for high spindle speed without wear and heat.

OPEN END CONSTRUCTION provides complete accessibility to the tooling area, and easy chip removal.

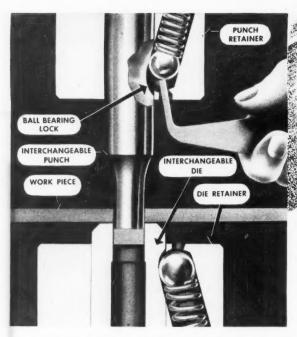


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Automatics

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The standard spindle is direct motor driven and is mounted on precision pre-loaded ball bearing. Total vertical adjustment is 10%". In and out movement of the table is 6%" with a longitudinal travel of 18".

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A TIME TESTED LINE OF MACHINE TOOLS

SURFACE GRINDER



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-and With Equal or Greater Accuracy?

The speed and precision of Sunnen Honing Machines make them real time and money savers in your tool room. For holes in dies, jigs and fixtures . . . for fitting dowel pins and ejector pins . . . Sunnen Honing is the quick and easy way — the ideal way — to smooth finish and close tolerance.

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SUNNEN TOOL ROOM MANDREL SETS provide overlapping coverage of complete honing units, ready for instant use. No storage problems—no lost motion or time in selecting proper size.

For FAST, EASY, LOW COST INTERNAL SIZING, use Sunnen Honing for best results. Free Bulletin MB-10 describes operation, gives full specifications. Write for it today.

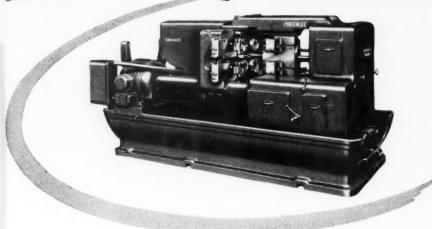
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RE-DESIGNED 4 - SPINDLE AUTOMATIC



HANDLES HEAVIER WORK LOAD ...

RIGIDITY AND APPEARANCE ARE IMPROVED

Several important structural changes have been made on the Greenlee 2-5/8" 4-spindle Automatic which increase its capacity to handle the heavier cuts demanded by ever-changing production methods. • An overarm has been added that rigidly ties the spindle carrier to the gear box, giving full support when heavy endworking tools are used. Increased lateral thrusts have been offset by tying the main tool slide to the overarm with gibbed ways. • These changes have not detracted from the accessibility of the work area. It is still wide open for set-ups and adjustments. • The Greenlee "4" embodies all the features of the popular 6-spindle machine... the convenient,



ts. • The Greenlee "4" embodies all the features of the popular 6-spindle machine . . . the convenient, built-in overarm lighting, identical tool cavities and tool holders, rapidly interchangeable cross-slide cams, quick adjustment of the main tool slide stroke, built-in coolant system, quick-change feed and speed gears, and many other advantages for maximum set-up and operating efficiency.

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in Precision Hardness Testing



Wilson has maintained in the past and continues to maintain a staff of Field Service Engineers who are responsible hardness testing specialists. Their responsibility is to (1) study users' hardness testing requirements, (2) recommend the equipment that will serve best, (3) see that it is correctly

installed and (4) make sure that it continues to give dependable service.

We are originators and exclusive manufacturers of "ROCKWELL" Hardness Testers, "ROCKWELL" Superficial and TUKON Microhardness Testers. Our years of concentration on developing and improving hardness testing equipment give our factory-trained representatives the necessary background for the best possible service to you.



BRALE is the only diamond indenter made to Wilson's precision standards for use on "ROCK-WELL" Hardness Testers and "ROCKWELL" Superficial Hardness Testers.

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GRAVITY DROP
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The CECO-DROP forges more minutes per hour, makes more forgings with fewer blows, is safer and easier to operate, costs less to operate.

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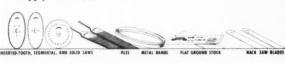




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Models from 20 to 1,000 g. p. m. Larger sizes to your specifications

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Reduce Cut-Off Costs Now!

and INCREASE Production

MOTCH & MERRYWEATHER TRIPLE-CHIP METHOD and START SAVING IMMEDIATELY!

> Method cut of 1728 pieces before blade needed resharpening. total tool cost per cut of free, exclusive of labor and overhead including / pro-rated original cast of blade plus cost of re

Triple-Chip

sharpening. \$.0029. Total tool cost for 100,000 pieces -\$290.00.

The Model O-A. with capacity to 4"

round or square, is one of a complete range of circular sawing machines for stock from ""
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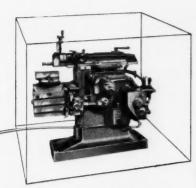
Alternate method cut off 260 pieces for cost of blade. Blade "done for"; no resharpening possible. Total tool cost per cut off piece, exclusive of labor and overhead-\$.0174. Total tool cost per 100,000 pieces - \$1740.00.

Faster feeds and speeds are one answer to increasing production and decreasing costs. Lower tool costs are equally important. Use of the Triple-Chip Method insures that the cut off ends shall be

> square, clean with milled finish, and accurate to length, eliminating facing or squaring operations. In addition, the narrow kerf of the Triple-Chip blade reduces stock waste to a minimum. Take advantage of the Motch & Merryweather Triple-Chip Method. It increases production ... lowers tool costs ... saves time and material.

Write us for complete information.

THE MOTCH & MERRYWEATHER MACHINERY CO. PENTON BUILDING CLEVELAND 13, OHIO



Production Package ready to go ...

Buy a Hendey 12" Universal Crank Shaper-plug it in-it's ready to go-without further purchases, because standard equipment includes table and vise for positioning and indexing work to any angle. You also get flanged mounted motor, mechanical controls on both sides, automatic lubrication, quick-change swivel head, adjustable, preloaded Timken bearings on the crank gear, plus many other features usually considered "extra".

The Hendey 12" Crank Shaper is finished like a fine watch, both inside and out. Here is an accurate, fast money-maker for tool room and production work. Write today for complete details.

BRIEF SPECIFICATIONS

Length of Stroke 1294" Strokes per minute 14 to 200 Speed changes Vertical travel of tool slide 456 Table top tilts either way 150 818/10" Max. distance vise to ram Max. rotation of table 360° Max. vise opening 10% 2825 lbs. Net weight Floor space 46" x 68"

Other Hendey Machines Include Tool Room Lathes — 9"- 12"- 14"- 16"- 18"- 20"- 24" Shapers — 12"- 16"- 20"

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These tools...used extensively for close-limit cutting of thin metal, paper, fabrics, rubber, leather, cork and plastic materials.

Reltool makes them to order of selected tool steel, carefully heat-treated and finish-ground all over. Edges are ground square or to any required bevel.

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MEANS
LOWERING COSTS
With the
OLIVER
DIE MAKER

There's no point in going modern just for the sake of having the latest gadget in your plant. But in these returning days of strenuous competition, we all have to find ways of saving. It's important not to miss any bet on cost-cutting.

If you are still making dies the old-fashioned way—by drilling and chipping away surplus metal—then Oliver has the dollar-saving answer for you in the line of DIE-MAKERS. By sawing, filing, and lapping, Oliver Diemakers save up to 60% over hand labor methods—pay for themselves quickly.

Two models are shown here. The Bench Model S-1 is a single speed Diemaker for use with tool steel up to 1" thick. The Heavy Duty Model has six speeds, works in metal up to 3" thick, has variable stroke to 5", plus hydraulic feed.

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AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS — DRILL
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Single stage, yet give performance equal to most two-stage regulators. Listed by Underwriters' Laboratories, Inc.

Jet moves in special guides for perfect seating. O-rings seal and cushion the diaphragm for better performance and minimum maintenance. All major parts of forged brass. Easy maintenance—may be disassembled on tank if necessary. Complete with gauges and standard tank connectors. Write: C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo.

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- GRIND RADIAL AND FORM RELIEF AT ONCE
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- GRIND ALL TYPES OF CIR-CULAR FORM TOOLS WITH SPIRAL FORM . . . life-time relief
- GRIND RELIEF ON O.D. AND FACE OF STEP TOOLS AT SAME TIME WITH .005" MAX. RADIUS IN CORNER

Also used as motor-driven headstock for grinding straight or tapered cylindrical work



The Circularity-Grinding Attachment accurately and easily produces form, radial or form and radial relief together on both straight and spiral fluted tools . . . on any lead or spiral. The amount of relief and spiral is quickly set up by scales on the attachment and relief produced is identical on every tool ground from the same set-up.

There are no special fixtures required for any tool and work may be held between centers or in a chuck. The attachment is easily adapted to any type of cylindrical or cutter grinder and can serve as a motor-driven headstock for cylindrical grinding when not grinding relief.

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DETROIT REAMER & TOOL CO.

Mfrs. of Special High Speed Cutting Tools
2830 East 7 Mile Rd. Detroit 12, Michigan

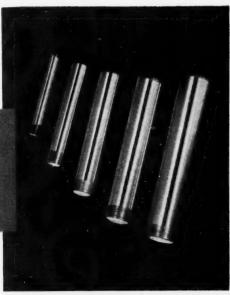
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Hand Pressure Can't Stall a

Mall Drill

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mutator or changing of brushes can be done without dismantling the drill. A husky 3-jaw geared chuck holds the drill bit firm—preventing slipping and chattering. A trigger switch releases more than enough torque to drill wood, metal or plastics.

Nine powerful models — 1/4" (in four speeds), 3/8", 5/16", 1/2", 5/8", 3/4", 7/8", and 11/4" capacities provide a size and type for every drilling job.

Ask your Supplier for MallDrills, Mall Grinders, Mall Screwdrivers and Mall Flexible Shafting or write Power Tool Division for literature.

MALL TOOL COMPANY

7814 South Chicago Avenue

Established 1921

Chicago 19, Illinois





Taft-Peirce Gage Blocks give you the ultimate in precision and long life. Made of the finest alloy steel; hardened and seasoned for wear and permanence; ground and lapped with high precision to a supersmooth and flat surface . . . these characteristics are your guarantee of longer wear-life.

For your extra convenience, each block has its size plainly marked on the edge ... a real time saver in selecting the right block every time. The compact mahogany case is so built that each block tilts into selector position at finger-tip pressure.

Set No. 82-A

Includes 81 standard sizes plus an extra block of .10005" which is extremely useful for checking in half-tenth combinations where tolerances are close. Price complete \$385.

Set No. 35-A

A smaller set of 35 blocks — yet adequate for the most commonly used combinations. Price complete \$200.

To add extra life to your Gage Blocks, two Tungsten Carbide Wear Blocks are available. These can be wrung to either side or both sides of a combination, to take the wear and tear of working contact, Both 505° and .100° Wear Blocks are priced at \$20.00 each. Set of two in Mahogany case \$40. For additional information write:

THE TAFT-PEIRCE MANUFACTURING COMPANY

WOONSOCKET 1



RHODE ISLAND

LOOK AT THIS PRESS

It's designed to provide industry with low-cost, high production units that are highly flexible in design and operation ... relieving heavier presses of short runs and lighter work. Presses are practically fool-proof in operation. Frame is extremely rugged. Fingertip controls are conveniently located at hand level. Available for immediate delivery, in standard width (between uprights) of 24"-31"-36"-42" respectively. Available in special width up to 72" at small additional cost. Movable bed plates. Pumping unit has bypass relief valve which can be set at any pressure up to press capacity. Presses available for either vertical or horizontal operation. All Standard presses equipped with 2-speed builtin hand pumps for more sensitive and versatile operation.

THESE "SPECS":

CYLINDERS: Standard Models furnished with 6" bore, 7½" stroke - spring return type; also 5" bore, 7½" stroke spring return type. Above presses are standard. Following can be furnished at additional cost: Double Acting, 6" bore, 7" stroke; 6" bore, 11" stroke; 5" bore, 7" stroke; 5" bore, 11" stroke. Special long stroke cylinders also available, up to 48" in length, for incorporation in suitable press frames of our make

PUMPING UNITS: These units can be supplied in various volumes and pressures, in a total of 13 combinations

Presses include V blocks, Gauge, Motor Controls, Pressure Regulator, etc., complete and ready to attach to electrical source.

THESE USES:

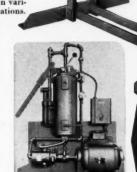
There are so many everyday production uses for these versatile KRW Hydraulic Presses that we have lost count. Here are a few of the more obvious ... blanking, forming, bending, broaching, straightening, stamping, embossing, numbering, upsetting, laminating, pressing and hot or cold forging. KRW Engineers are daily developing other uses. If you have only a vague idea of how these presses might be used in your plant, let us have it in a rough form. We'll do the rest.

THESE PRICES:

Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows, F. O. B. Factory: 25-ton press from \$727.00 to \$992.00. 50-ton press from \$806.00 to \$1058.00. 60-ton press from \$1070.50 to \$1135.00. 75-ton press from \$1198.00 to \$1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra. *Subject to change without notice.

K·R·WILSON

215 MAIN ST. BUFFALO 3, N.Y.



MODERNIZE AND MOTOR-ZE YOUR PRESENT KRW PRESS with one of these com pact motor drive units. They come complete ready to connect to your press. Require very little extra floor space. Write for conversion unit prices, giving the capacity and serial number of your press.

AIL THIS COUPON

It will bring you all the money-saving facts about these low cost, high production hydraulic presses. Now is the time to get ready for the highly competitive days ahead.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please send me complete information on KRW Motor Driven Presses as follows:

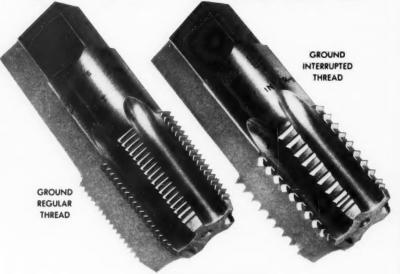
- 25-ton 50-ton 60-ton 75-ton presses
- motor drive conversion unit Press Cap.

Serial No.

4ddress City and Zone ...

State

PIPE TAPS BY **BAY STATE**



REGULAR THREAD

High Speed Ground High Speed Ground for Steel Dryseal Taper NPTF High Speed Cut

Carbon

Dryseal Straight NPSF

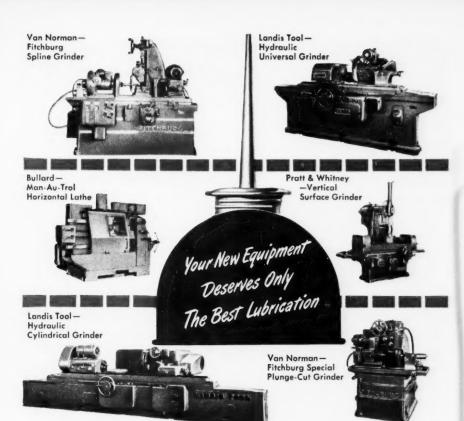
INTERRUPTED THREAD

High Speed Ground High Speed Cut Dryseal Taper NPTF

On Nearby Shelves of Your Industrial Supply Distributor

BAY STATE TAP & DIE COMPANY

MANSFIELD, MASSACHUSETTS



Get Skilled Cities Service Lubrication From the Start

Investigate the advantages to be gained by using Cities Service fine quality petroleum products. Whatever the machine or service you'll find the right lubricant for your particular requirements. Cities Service Lubrication Specialist will provide sound recommendations on any kind of lubrication problem.

FREE . . . New Fact-Filled Booklet For The Metal Machining Industry

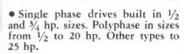
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CITIES (S	ERVICE	
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Lima Gearshift Drives

provide selective
drilling speeds
for Guibert Steel
Company's
TOGGLEBUG

The "TOGGLEBUG"
drills structural steel—
angles — channels — I
beams—plates, etc.
Manufactured by
Guibert Steel Co.,
Pittsburgh, Pa.



LIMA GEARSHIFT DRIVES are built in sizes and ratings to provide "selective-speeds" for all types of machine tools. Lima Drives are also adaptable to a wide range of machinery of original equipment manufacture. We welcome inquiries regarding motorization problems. Write us today.



THE LIMA ELECTRIC MOTOR COMPANY

Accurate Control... is a MUST at AMPCO METAL, Milwaukee

Case History at AMPCO

To obtain definite physical properties that meet strict specifications, this 490 pound propeller blade is heated to 1650°F. for four hours, quenched and drawn at 1125°F., then requenched and redrawn for stress relief at 600°F.

Multi-Range FURNACES

Ampco alloys are made in vari-

ous grades and modifications.

The modifications depend upon heat treating which must be accurately controlled to obtain desired physical properties. In this, Ampco technicians excel. Bill Gruss, heat treating foreman says, "One of the reasons I like Hevi Duty furnaces is the fact that they always hold the uniform temperatures I want throughout the heat."

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Model NUH-364818-A Hevi Duty Multi-Range Furnace — 70 KW rating. Chamber size 36" wide, 48" long and 18" high. Has one motor-driven fon to increase speed and uniformity of heating.

Hevi Duty Multi-Range Furnaces are all purpose furnaces that give you a range of temperatures from 400° to 1850° F. with a high degree of uniformity, Available with single or multiple fans and controls for special programs.

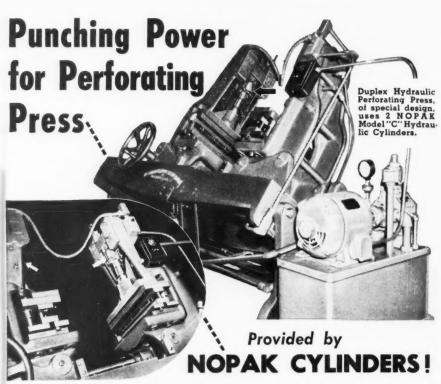
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HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVER DUTY ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS - CONSTANT CURRENT REGULATORS

MILWAUKEE 1, WISCONSIN



NOPAK Model "C" Cylinder, either Air or Hydraulic, is designed for flat base mounting and vertical pushing power, either up-or-downstroke.

GALLAND-HENNING MFG. CO.

2758 SOUTH 31st STREET MILWAUKEE 7, WISCONSIN

This unique press was specially designed and built by Verdin, Kappes & Verdin, Cincinnati, O., for high-speed. precision perforating of matching elbow blanks.

Two 3" Model "C" NOPAK Hydraulic Cylinders, controlled by one foot valve, supply ample power to perforate sheet steel, up to 24 gauge ● Maximum speed, 100-1" strokes per minute Maximum capacity, eleven 9/64" holes • Operating pressure, 400 P.S.I.

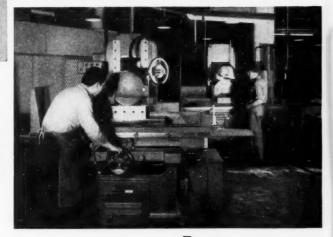
This press has reduced spoilage substantially, has resulted in greater accuracy, has increased operating safety by eliminating the flywheel. Chances are that your standard or special machines can be designed for or converted to air or hydraulic operation by employing NOPAK Valves and Cylinders.



Representatives in Principal Cities DESIGNED for AIR and HYDRAULIC SERVICE

A 5601-1/5I

Enthusiastic Customers do our BEST advertising



The Rotor Tool Company, Cleveland, Ohio, uses a Model F Grand Rapids Hydraulic Feed Surface Grinder and a Model 55. They call their purchase of these machines an "excellent investment."

You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

- 1. One-piece column and base casting for vibrationless rigidity
- 2. Precision ball-bearing spindle which is greased for life
- 3. Bijur one-shot lubrication system eliminating hand oiling
- 4. Patented vertical movement of wheel head for quick, accurate adjustments
- 5. Portable coolant tank for ease of coolant replacement
- Vane type hydraulic pump for fast longitudinal table travel

to some you -

Your inquiry concerning your specific grinding needs will zeceive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.



308 Straight, S. W., Grand Rapids 4, Mich.

GRAND RAPIDS GRINDERS



POWER HACKSAW BLADE

Twenty-five years ago Atkins introduced the first high speed steel hacksaws made in the United States...and for sawing any of the high-carbon tough jobs or any other steels that can be cut with hacksaws, Atkins "Silver Steel" Hacksaws still are the finest blades made.

Now, for sawing lower alloy steels, where high production cutting is essential, Atkins presents the ATKINS SILVER FLASH... The product of years of metallurgical research and new methods of manufacturing and heat treating, ATKINS SILVER FLASH is a tough, yet exceptionally flexible blade. It reduces blade breakage to a minimum. Its teeth stay sharp longer with little chipping. Resistance to abrasive action is excellent. It cuts fast and clean to extremely close tolerances—reduces costs due to its longer life.

Ask your Industrial Distributor to demonstrate ATKINS SILVER FLASH performance on your own cutting jobs.

> ATKINS SILVER FLASH Power Hacksaw Blades are packaged 10 to a box. Available in all standard lengths and tooth sizes.

LOOK at these Typical

249 pcs. 1" rd. SAE 4140

8 machines, 1 blade

ea. 35.000 sq. in. 41/2" sq. 1045

9 hrs. continuous

cutting stainless

Atkins Silver-Flash Performance Reports

steel

SF614 P

SF 4714

SF 6718



E. C. ATKINS AND COMPANY . Home Office and Factory: 402 South Illinois Street, Indianapolis 9, Indiana Branch Factory: Portland, Oregon . Branch Offices: Atlanta. Chicago · Les Angeles · New Orleans · New York · San Francisco



MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

Climinate HIDDEN COSTS (1) THAT CUT DOWN PROFITS!

Unnecessary operations may be holding down your profits. Brightboy may prove to you that separate burring, cleaning, finishing and polishing steps can be eliminated.

In countless instances, Brightboy combines all these operations into one. Its abrasive and rubber compound gives a unique surfacing action so smooth, so clean, that it frequently serves as the final polish. Brightboy takes over following the rough grind; bridges the gap between the grind and the buff. Precision-finishing Brightboy works to close tolerances, can be shaped to contours, doesn't load, gum or fill, requires no special preparation before use. Test Brightboy in comparison with your present procedure on work requiring any or all such finishing operations.

Brightboy

DATA FOR METHODS & PRODUCTION MEN may be obtained through your dealer; also the Brightboy Catalog Manual and prices. Write the Brightboy Service Department if your problem is a special one.

BRIGHTBOY INDUSTRIAL DIVISION Weldon Roberts Rubber Co., Newark 7, N. J.

America's Pioneer Manufacturers of Rubber-Bonded Abrasives

Brightboy



The Soft Rubber Binder Cushions The Abrasive

AIR CONTROL VALVE

PUSH BUTTON OR AUTOMATIC

Control!

FOR

IYPE 1 – Advance and return cylinder strokes controlled through two push buttons or switches.

TYPE 2 - Single push button control for advance; automatic return.



- . AIR CYLINDERS
- . AIR CIRCUITS
- AIR OPERATED PRESSES

Save Time! Boost Production!

Speed up operations! — You can do it with this new electric valve that makes effortless, labor saving *push button* or automatic control SIMPLE... DEPENDABLE... and ECONOMICAL for a wide variety of applications where compressed air is used for power.

It's SIMPLE to use. Fits directly into air supply line. No relays or pilot lines needed. *Ideal* for remote control...interlock or sequence operation... building into equipment.

It's DEPENDABLE. Built to withstand hardest kind of

service. Quiet disc type valve
— positively air-tight; selflapping. Pilot controlled;
piston operated. Continuously
rated solenoids. Capable of
180 cycles per minute, or more.

It's ECONOMICAL! Small and compact. 10 watt solenoids—low power requirements; only momentary contact needed. Simple electrical connections with plant wiring. Sizes 3/6", 1/2", and 3/4". For any pressure from 25 to 150 p.s.i. Complete information on request. HANNIFIN CORPORATION, 1101 South Kilbourn Avenue, Chicago 24, Illinois.



A New HANNIFIN Product

Send for New Bulletin No. 230

Hammons

CARBIDE TOOL

AND
CHIP BREAKER GRINDERS

Save TIME TOOLS WHEELS



CB-77 Chip Breaker and Diamond Finishing Grinder

WD-10 Wet or Dry 10" Carbide Tool Grinder



Hammond Carbide Tool Grinders will soon pay
for themselves thru
greater wheel economy, longer tool life
and FASTER grinding.
They relieve toolroom
bottlenecks and step up
production. Write for Carbide Grinder Catalog 220.

Hammons Machinery Builders

1615 DOUGLAS AVE. . KALAMAZOO, MICH.

Carbide Tool Grinder

Does your budget prevent your Common Sense from saying



A CHANGE IN GAGING ROUTINE AS WELL AS IN GAGES

cut out one inspection, reduced scrap, and eliminated fatigue. When the Van der Horst Corp. of America, Olean, New York, first had the job of porous chrome plating the bores of aluminum cylinders, they had to gage each piece before plating. Now the cylinders are carefully gaged at production, thus standardizing and simplifying the plating process. After plating they are

spected at three points simultaneously for diameter and out-of-round. Tolerances for diameter are .002" and .0015"; for out-of-round, .001". Change from old style gages to Federal Air Gage has increased inspection speed (including visual inspection for hone marks, bare spots, and porosity) from 150 to 250 parts per hour. To date



Gaging the inside width of a rectangular hole is easy and more accurate with a Federal Air Gage.

YES?

Budgets are necessary guides for routine departmental expense. But, routine methods are not always the most economical, and if there is a better way to do the job—at less cost—you can beat the budget.

Some executives have an old-fashioned idea that gaging is a non-productive or overhead cost. Proper gaging, properly tied into production, not only pays for itself—it actually pays some of the cost of production. Facts prove that a carefully selected Indicating or Visual type of gage shows the workman bow be is doing, keeps his production in dimensional control, and prevents waste in scrap, machine time, and manhours. Remember, you cannot sell scrap at a profit or get back lost time.

Read how the right gage is paying off at the Van der Horst Corp. See if you have cases in your plant where a change in customary procedure will help. It won't obligate you at all to consult us about gaging improvements — you may find a way to beat the budget. Write Gaging Headquarters—

Federal Products Corporation, 1112-F Eddy St., Providence 1, R. I.



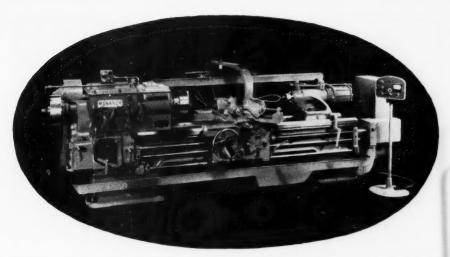
Sphericity, angularity, and two depths are checked simultaneously with this combination Federal Dial Indicator and Air Gage. A real time saver.





ECISION MEASURING INSTRUMENTS

DIAL INDICATORS . INDICATING GAGES . SPECIAL GAGES .
ELECTRONIC AND AUTOMATIC SORTING GAGES . AIR GAGES



FIVE HOURS FIFTY-EIGHT MINUTES FASTER!

•			-	- 8 7		2-48 2 36	15	2",1"
211	m 2 m	- 18,	- 7f)	15 m - 64 -	42 000 64	2-48	108 -318-3	7 7 7
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			25	5 - 5 -	-3-3-	13 15 3		T - 8-

With Monarch's single-tool Air-Gage Tracing, this long shaft is turned complete in two hours 20 minutes. Multiple-tool machining of the same part required eight hours 18 minutes.

Note particularly the tough metal—the depth of cut—the 103-inch length. Air-Gage Tracing takes all these in stride. Moreover, it is equally applicable to the turning of multiple-diameter shafts or to the turning, boring and facing of contours to meet almost every practical application need. Nor does size of workpiece present any limitation—as witness the job illustrated.

A constantly growing list of our customers is finding the way to reduced costs and improved quality through Air-Gage Tracing. May we show you how it will provide "peak production at a profit" in your shop?

JOB FACTS

Part—Extruder Shaft Material—SAE 4150 heat-

treated

Hardness—320 Brinell Operations Performed—turn

complete

Maximum Cut Depth—¾"
Cutting Tool—Cemented

Carbide
Machining Time—2 hours 20

minutes

Machine—20" x 144" Monarch

Model M Engine Lathe, AirGage Tracer-Equipped

Monarche Monarche

THE MONARCH MACHINE TOOL CO., Sidney, Ohio

FOR A GOOD TURN FASTER - TURN TO MONARCH! TURNING MACHINES

Announcing

THE NEW L-W MEDIUM DUTY 5" UNIVERSAL CHUCK

One of the most outstanding values in the L-W line of unusually rugged chucks. The body is threaded to fit any lathe having 1½"-8 thread spindle, including most models of Atlas, South Bend, Logan and Clausing. By the use of a conventional back adapter plate it mounts on any size and type lathe. Also ready for mounting on the L-W 6½" SD Dividing Head.



L-W ALSO OFFERS NEW HEAVY DUTY 6" AND 8" 4-JAW INDEPENDENT LATHE CHUCKS

These new 6" and 8" chucks are of the conventional type using hardened threaded jaws, screws and anchor bearings—same type of construction as our larger size chucks.

All L-W LATHE CHUCKS

now feature three separate pinions instead of the usual single pinion. Permit greater accuracy. Afford less wear on the ring gear. Easier to operate. The two sets (male and female) of hardened reversible jaws, with accurately cut, hardened and ground steps, assure a tight grip. The body is a semi-steel casting, ground to a very fine finish. The screws and bearings are made of tough steel and hardened for long, hard usage.



4-JAW HEAVY DUTY INDEPENDENT LATHE CHUCKS

6", \$18.30 12", \$57.35 8", \$22.95 14", \$66.65

10", \$50.20 16", \$87.65

18", \$115.55

3-JAW UNIVERSAL LATHE and SCREW MACHINE CHUCKS

Medium Duty: 5",...\$25.30 Heavy

Duty: 61/4" .\$35.20 71/2" .\$44.25 101/2" .\$92.60 Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products

L-W CHUCK COMPANY 28 SO ST. CLAIR ST. TOLEDO 4, OHIO

Now... Butterfield's

Tools
Include the
NEW
FLEX-RITE
REAMER!

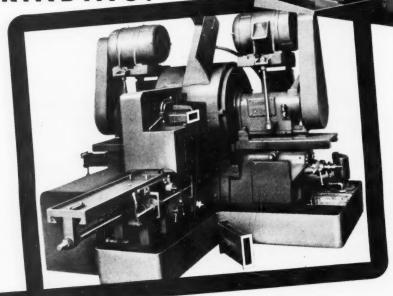
Your production-reaming problems will be greatly simplified with Butterfield's new Flex-Rite reamer. Greater accuracy...lower costs...and higher production rates are made possible by Flex-Rite because the blade-expansion feature permits repeated sharpenings while maintaining original size 100%.

And remember, like all Butterfield tools, Flex-Rite reamers are 100% inspected ... because only 100% inspection makes quality certain.

See this latest addition to the Butterfield line at your nearby distributor. Union Twist Drill Company, BUTTERFIELD DIVISION, Derby Line, Vermont and Rock Island, Quebec.



Double Production with GARDNER Double GRINDING!



WORK DATA

Part Heat Inancifor Unit Material Cast Grown Operation United Two Sides Tolerances. No for Parallalism. Mai for the

Production 20 to 30 Pieces Per Hour Feed Hand Load and Unloa to Special First ncial Fixture Mounted on Hydraulic Stiding Table
Machine #120 A-30"
Bardner Double Grinder

By grinding TWO surfaces with ONE pass, many of your parts can be parallel-surfaced twice as fast - and costs can be cut right in half! In some cases, by using special fixtures, for hardto-handle units, production can be more than doubled. The cast-iron heat transfer unit shown here, is one example out of hundreds. Learn how GARDNER Double GRINDING will boost your rate of production on parallel-surfacing jobs -while lowering your per-unit cost.



Use Modern GARDNER WIRE-LOKT Abrasives on YOUR Disc Grinders

Write for Our Double GRINDING Bulletinl

GARDNER - GRIND YOUR Flat SURFACES

RDNER MACHINE COMPANY
East Gardner Street *** Beloit, Wisconsin, U.S.A.

Connouncing "NORMA" Stability-Tested GREASE

For General Purpose
Bearing Lubrication



- CUTS BEARING LUBRICATION COSTS
- . INCREASES BEARING LIFE
- . ASSURES EFFICIENT BEARING OPERATION

Users of ball and roller bearings can now obtain "Norma" Stability-Tested grease for all types of general purpose bearing lubrication.

Used for years in Norma-Hoffmann prepacked sealed bearings, "Norma" Stability-Tested grease has been giving excellent performance in all types of applications.

Outstanding advantages include -

High Resistance to Oxidation in storage and in service as proven by the well known Norma-Hoffmann Oxidation Bomb Test.

Insoluble in Water — will not emulsify or aerate in the presence of condensed moisture.

Protects Against Corrosion — Actual field tests in the Canal Zone prove its outstanding corrosion resistance. Laboratory Tested—Each batch of grease is laboratory controlled to meet rigid specifications.

"Norma" Stability-Tested grease is available in tubes for easy bearing lubrication and in bulk for large quantity grease users. Keep your bearings operating at peak efficiency, use "Norma" Stability-Tested grease. Write for prices and information.

RUNNING TESTS FOR GREASE PERFORMANCE

The test units, illustrated, determine the lubricating properties of "Norm" Stability-Exted grazeas at elevated temperatures and under actual running conditions. Greases are tested in hearing operated at constant speed and temperature with regular cooling and starting cycles. Bearings are thrust loaded by springs. In other test units, bearings are loaded radially.

NORMA-HOFFMANN
Precision BEARINGS

HORMA-HOFFMANN BEARINGS CORPORATION Stamford, Connecticut

Field Offices; New York · Chicago · Cleveland · Detroit · Cincinnati · Los Angeles · San Francisco · Dallas · Seattle · Phoenix



Here's what they tell us

ABOUT THIS NEW DRILL:

"... we estimate it has drilled a total of 6682', or 3100 times its length!"

"... after about 75 hours, the drill was reground, put back in the machine, and is still running!"

"... 133,850 pieces in No. 8620 Steel with 1 dozen G-Style Drills!"

...the "AMBORE" DRILL



that gives 50% More Production

HERE IT IS! Here's the new Morse Drill
...with its new thousand-dollar name...
...the "AMBORE"...the drill of fewest
changeovers.

Here is the first really big news in drills since Stephen Morse produced the first twist drill. This new drill is ground from the solid . . . with heavier web, constant angle, and wider flutes that clear chips in a faster, easier flow. And then, finally, it's

processed by a New Morse Method that gives this drill more strength, toughness, and flexibility than any other drill now made...to withstand the higher speeds of today's production demands.

Proved by exhaustive field tests, this new Morse Drill is available to you...now...in 59sizes from No. 80-30 to 1/4. "//"... from your own Morse-Franchised Distributor. Call him today on your problem.

SOLD EXCLUSIVELY THROUGH MORSE-FRANCHISED DISTRIBUTORS

Accuracy, Quality, Uniformity: the MOPSE Code of Cutting, Tool Munifortune

MINE COMPANY

A DIVISION OF VAN NORMAN COMPANY



BRANCH WAREHOUSES: NEW YORK, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO

for
piercing,
riveting,
hole locating
or
as a drill
combi-

nation

You'll always find this
KNU-VISE FLEXIGRIP

a Very flandy

TOOL

When parts to be held together for piercing, riveting, drilling, and such operations are not of uniform thickness (as often happens) operations are slowed up. You need a Flexigrip that will automatically adjust itself to these variations in thickness of materials clamped.

Let us tell you more about these efficient pliers. Send for new catalog.

FGP-1200 (shown) has gripping range 0 to ½" with corresponding clamping pressure 65 lb. to 125 lb.

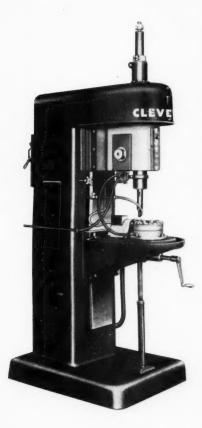
KNU-VISE PRODUCTS

LAPEER MANUFACTURING CO. 3056 DAVISON ROAD . LAPEER, MICHIGAN









Are there any economies like these in your tapping operations?

These are typical examples of production tapping economies Cleveland users are enjoying.

Cleveland's lead-screw feed and precision depth control, in combination with automatic cycling and engineered feed devices, permit single and multiple hole production tapping—even on class 3 and 4 fits—at speeds never before considered possible.

If your product must be tapped—one hole or a score—there is every possibility Cleveland engineers can find a way to do the job with similar savings.

Why not send sample parts or blueprints for their study and recommendations? Address The Cleveland Tapping Machine Company, Hartville, Ohio.

> CLEVELAND Lead screw tapping machines

For the Time! Electronic on Here is a unique aid that permits

ELECTRALIGN

Exclusive New Brown & Sharpe Development Here is a unique aid that permits grinding machine operators to align a swivel table for straight or tapered work after only one preliminary grind. ELECTRALIGN eliminates costly time-consuming, cut-and-try operations.

This exclusive arrangement for Brown & Sharpe Cylindrical Grinding Machines easily detects displacements of .0001" in swivel table movement. Deflections are direct reading ... no interpolation or transposition of figures needed.

The following Brown & Sharpe Grinding Machines are obtainable with ELECTRALIGN: Nos. 1, 2, 3, 4, Universal—Nos. 5, 10, 12, 20, 22, 23, Plain—No. 13 Universal and Tool.

For complete details, write Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

BROWN

હ

Alignment of Swivel Table Grinding Machines

ACCURATE SETTING EASILY MADE

Corrections in swivel table alignment may be made simply and precisely. No need of regrinding several test pieces to obtain proper adjustment.

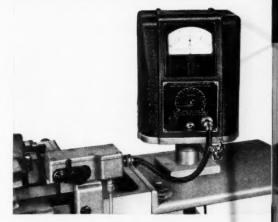
SET-UP TIME SHARPLY REDUCED

After the ELECTRALIGN amplifier pointer is set to the ten-thousandths desired to swing work, operator makes single, positive correction by moving table through its regular adjusting mechanism until pointer reads zero. May be done during grinding operation.

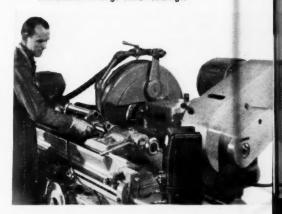
EASIER OPERATION FASTER PRODUCTION

On long work ground to close limits, even a slight taper may represent a large part of the allowable tolerance. On this type of work, ELECTRALIGN makes set-ups easier—more positive ... makes faster production possible ... reduces risk of spoilage.

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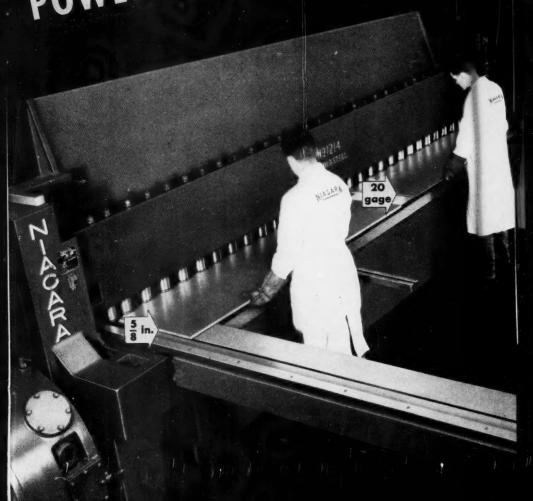
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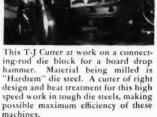
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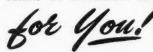








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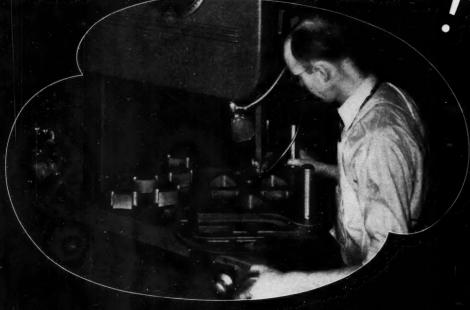
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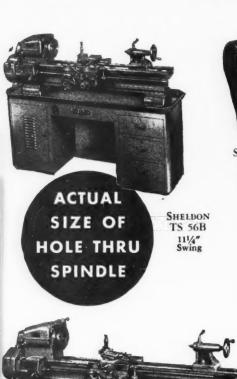
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which are so rarely used, in actual practice the scope of this fixture is limited only by ability of the toolman to work out a setup.

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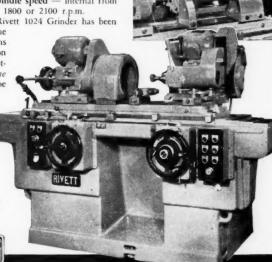
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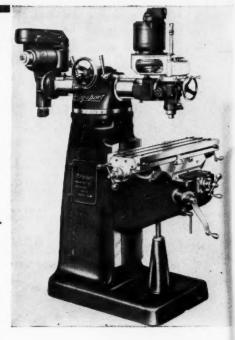
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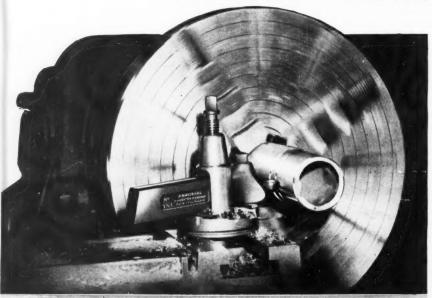
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Machine Shop

JUNE 1949

Vol. 22, No.

Features in this Issue

Grinding with Formed or Multiple Wheels

By J. F. Fischer

If you are required to make the decision of grinding an irregularly shaped workpiece with either multiple wheels or a formed wheel, the suggestions given by the author in this article will enable you to make the wisest choice. Page 98.

An Analysis of Blanking Die Designs, Part III

By C. W. Hinman

The important construction features of blanking dies which were described in the two previous articles of this series are combined in the design of the blanking dies in the present article. Page 106.

Practical Pointers on Steel Treating, Part VI

By W. R. Bennett

In addition to offering some valuable advice on the use of oil-hardening manganese steel, Mr. Bennett discusses cold header dies, quenching baths and re-hardening. Page 116.

Compressed Air—An Important Aid in Forming Operations

By Bartlett West

Several unusual applications of air-operated equipment found at the Ford Motor Company's River Rouge plant are described in this article. Of particular interest to the reader will be the applications of compressed air equipment in the press shop. Page 134.

How the New Thread Standard Affects You

By Herman H. Lind

The author tells how the producers and users of fasteners may easily adjust themselves to the newly adopted thread standard. Page 146.

Proper Care Prolongs Micrometer Life

By Thomas Trail

A complete set of instructions covering the proper care of a micrometer. Page 160.

A Philosophy of Human Relations, Part VI

By Dillard E. Bird

Mr. Bird concludes his present series of articles with a review of the principles that should be considered in the planning of an employment stabilization program. Page 174.

Grinding With Formed or Multiple Wheels

The author describes a number of the more important factors to be considered in the selection of a method

By J. F. FISCHER

Manager, Sales Engineering Simonds Abrasive Company, Philadelphia, Pa.

A NY grinding job, other than a straight cylindrical piece, can often be done cheaper with formed wheels, or a multiplicity of wheels mounted on one grinding spindle. If the part is at all complicated, or if it requires many operations, this fact is, of course, obvious. But it may not be so obvious if the part is simple, such as a straight cylindrical piece with a slight bevel, say, cut in. Yet the

cutting of the bevel may require another setup or, if it does not need to be accurate, at least some hand traverse may be necessary. Either method will run up the cost, and should be eliminated if possible.

It goes without saying that when a "V" or a radius must be formed, the form must be carried on the wheel face. But with modern truing equipment, and with the comparatively

new technique of crushing the wheel, not only such simple forms but also much more complicated faces may be produced at low cost and much saving of time. Sometimes, using this technique, it is even possible to grind pieces of a highly complicated design that could not otherwise be ground economically, if at all.

The wheel shown in Fig. 1 is dressed to grind a straight cylindrical part with a taper. The part is ground in a single setup and a single operation by plunge-cut grinding, whereas, by the previous method, using a wheel set at an angle, two operations were required. Figure 2 shows the face of a wheel which is trued to a fairly complicated form. Without a formed wheel, the part would have been difficult to grind. The formed wheel does it in a single plunge-cut, grinding all the surfaces simultaneously.

Figure 3 shows an 11-inch wheel trued to grind a part that has eight individual tapers. Before using the formed wheel each taper had to be ground separately. This method was so slow that production fell behind badly. Although the sketch appears to

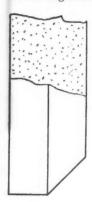


Fig. 1 — Drawing of a wheel dressed to grind a cylindrical part with a taper.

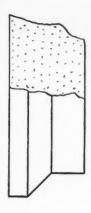


Fig. 2 — Face of grinding wheel may be trued to a fairly complicated form as shown in this drawing.

show that the face of the wheel is straight, actually it consists of eight individually beveled faces, but the faces are so alike that they do not appear to be separate. The wheel is trued with a profile truing device.

In Fig. 4 a 30-degree chamfer is ground on a solid workpiece by means of the profile which is dressed into a wide faced wheel, Formerly this chamfering operation was performed by means of plunge cut, which

caused the wheel to break down too rapidly and did not provide an entirely satisfactory surface. In the new method a wide faced wheel is used, the right side of which is trued to a definite profile, the left side being straight. The wheel is fed longitudinally past the work and the right side of the wheel rough-cuts a chamfer. The left side of the wheel, which is straight, does the finish cutting. The part is reversed in the chuck and the eight-degree 16-minute chamfer at the other end is ground with a similarly profiled, narrower wheel. Obviously, the grinding is a gradual operation, but this method of dressing the wheel is a great time saver.

Figure 5 shows a wheel that is beveled at both edges to grind a counterweight used to balance a crankshaft. The circular contour of the counterweight is finished with the straight part of the wheel, while the amount of stock necessary to balance the shaft is taken care of by means of the bevels. The machine is equipped with an oscillating work-head to keep the work in contact with the wheel at all times.

Much time is saved by the use of this device.

The complicated part shown in Fig. 6 was ground with a formed wheel. This piece was ground with a single wide wheel, in one plunge-cut. Most grinding engineers feel that it is better to grind such complicated parts with a multiplicity of wheels, because it is difficult to maintain accuracy of contour by any other method. Usually more than one operation should be used.

With a sufficient number of wheels mounted together on one spindle, it is sometimes possible to grind all surfaces at once. Sometimes, however, one wheel will be grinding metal while the others are grinding air. Often multiple wheels can be used for grinding on plain cylindrical machines. A specially designed grinder may be required if the width of the combined wheels is too great for the space between bearings. The special may be necessary in order to secure great rigidity in view of the great wheel weight and the great pressure exerted against the spindle when the wheel is in contact with the work.

Such a machine is the camshaft

grinder in which eighteen wheels are mounted to grind simultaneously the recesses between the cams and the main bearings of a cast steel camshaft. The multiple wheels do in one infeed what would require 18 infeeds and 18 withdrawals on a regular machine. To cut the time of truing, a hydraulically - operated slide mounting four diamonds is used to true all



Fig. 3 — Drawing of a grinding wheel having eight individual tapers.

wheels in a single traverse—not more than five at a time.

A similar setup consists of nine wheels which grind simultaneously seven line bearings, the fan and gear fit, and the outside diameter of the flange.

The job shown in Fig. 7 is a simple setup. It consists of two wheels of different widths grinding two different

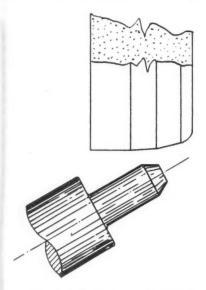


Fig. 4—Drawing showing a profile which has been dressed into a wide-faced wheel.

diameters at the same time. Too often such a job is done on two machines, or by grinding the diameters separately. Later the two adjacent diameters, which are of the same size, are ground with a wide-faced wheel which grinds the diameters simultaneously, spanning the groove.

Two chamfers are ground by the use

of the formed wheels shown in Fig. 8. The straight diameter and the adjoining chamfer are ground in the first operation, the narrow wheel being idle. Shifting the work brings the narrow wheel into position to grind the other chamfer while the wider wheel remains idle.

Grinding with the wheel set at an angle is economical, for aside from the

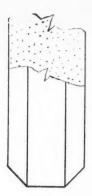


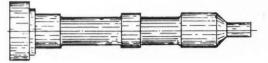
Fig. 5 — Drawing of a wheel that is beveled at both edges.

better surface quality achieved, production may be increased from ten to fifteen times, compared to straight wheel grinding. This method is particularly desirable when both a face and adjacent surface must be ground, whether the corner between them is filleted or square.

When grinding this type of work, with the axes of the wheel and the work parallel, two methods are available for feeding the wheel. The side of the wheel may first be brought into contact with the shoulder, finishing with the face contacting the periphery of the piece. Second, the periphery of the piece away from the shoulder may first be contacted, and the wheel traversed until it touches the shoulder. Both methods subject the wheel to excessive pressure sidewise, for which it is not designed. The first method may cause the wheel to break down in a short time, making an imperfect cor-

Grinding with the side of the wheel





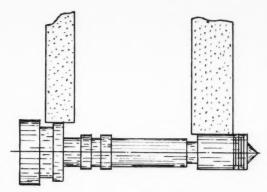


Fig. 7—Drawing of two wheels of different widths for grinding two different diameters at the same time.

increases the area of contact. To obtain adequate cutting action, greater wheel pressure and a harder grade of wheel is needed, which may cause burning of the work.

This method also makes it difficult to get enough coolant between the wheel and the work, and particles of grit and bond are not washed away quickly enough; thus they roll, scoring the work and reducing the ability of the wheel to remove material. Softer wheels will hold their shape without difficulty and cut faster; thus they may be used when the wheel is set at an angle.

Some shoulder grinding is done with

the wheel set at a 45-degree angle. Experience shows, however, that the best results are obtained with either a 30-degree or a 40-degree angle. Any of these angles are, of course, available on a universal type of machine. Most

plain grinders used for 30-degree grinding are plain cylindrical machines with the wheel permanently set at the angle, and therefore are really single-purpose machines.

The 40-degree machines are so built that the wheel can

be set to do straight cylindrical grinding by moving the head so that its axis is parallel to that of the work. Angular grinding is essential for grinding a diameter where the work or the work-holding fixture is so designed that it would interfere with the wheel if the wheel were in normal position.

In most angular grinding the face of the wheel must be formed. If grinding to a shoulder, the face is, of course, trued to a right angle. Multiple wheels may also be used in an angular setup.

Take for example, an ordinary job that consisted of grinding a diameter

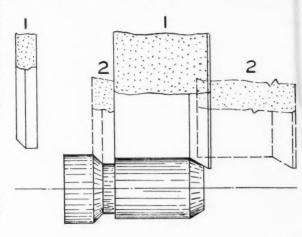


Fig. 8 — Two chamfers are ground by the use of the formed wheels shown in this drawing.

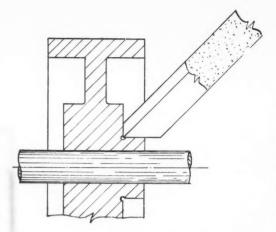


Fig. 9—Drawing of a formed wheel designed for grinding work at 45-degree angle.

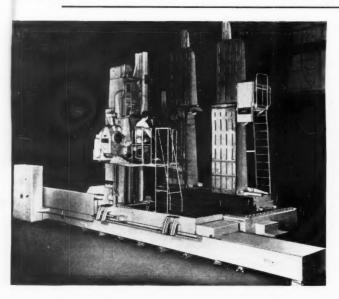
mon. The operation could not be performed with a regular plunge-cut because of the rim of the work, which prevented a straight wheel from reaching the surface to be ground. Setting the wheel at an angle of 45 degrees made it possible to reach the work with the wheel. It also eliminated burning and produced a better finish. The wheel was

formed to a 90-degree angle.

The illustrations in this article do not, of course, begin to show all the possibilities of formed and multiple wheel grinding. They are, however, quite typical and may be useful in suggesting methods by which work now being ground by conventional methods may be turned out more rapidly and without sacrificing quality.

and an adjoining shoulder. Formerly it was ground with a straight infeed movement. Then the face of the wheel was trued to 90 degrees, and the wheel was fed in at an angle of 30 degrees. Production was increased ten-fold. Burning, which had been serious, was eliminated. Wheel marks on the shoulder were practically eliminated.

The problem shown in Fig. 9 is com-



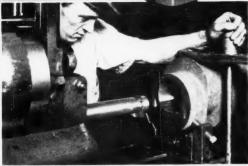
Largest Keller

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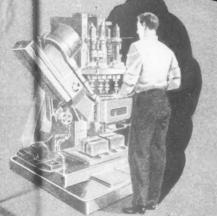
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An Analysis of Blanking Die Designs, Part III

The individual construction details which were described in the previous articles have been combined in the design of the blanking dies presented here.

By C. W. HINMAN Designing Engineer

THE drawings which accompany the text of this article serve to illustrate typical designs of conventional blanking dies. In the construction of these dies, all of the technical details discussed in the previous articles of this series have been incorporated. These dies are of the type that must be built with proper die and punch clearance. The punch clearances are certain percentages of the work material thicknesses. Large blanking dies for sheet stock of greater than about 16-inch gauge should have shearing angles ground on the die faces in order to reduce the punch pressure for cutting the blank. All of these necessary conditions were illustrated and described in the two preceding articles.

Dies Equipped With Channel Stripper Plates

Figure 1 shows an illustration of the usual design for a large blanking die equipped with a positive channel stripper plate. The positive channel stripper plate is designated as **J.** This type of die is the simplest of all conventional blanking dies, and uses a hand feed and pin stop to halt the work strip at blanking stations. In use, the die is set up in a straight-side

press and sheet stock is fed into the die from front to rear. This method of feeding is much slower than when feeding from right to left as in a gap-frame type press such as is employed for cutting small blanks. Feeding from front to rear is usually a two-man job; one man in front of the press inserts the strip in the die, while another man at the rear helps to align the strip and pull through the scrap frame, and disposes of the scrap frame after the strip has been run through the die.

Some dies and presses have been equipped with a scrap cutting device placed at the rear that severs the scrap frame into short lengths. However, many press users object to the use of such a device because it chops off the scrap frame, the latter often being necessary to pull through the strip when cutting the last few blanks. Scrap cutting is especially objectionable in progressive dies where several operations may be performed after the work strip end has passed under the entrance to stripper plate **J.**

The pin stop provides the simplest of all methods for halting the work strip at correct blanking center distances for cutting the blank. The stop pin is driven in die block **F**, as shown,

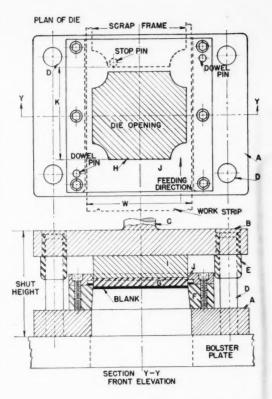
Fig. 1—Drawing of a plain blanking die in which a positively attached stripper channel is used.

and is located from edge H of the die, parallel with the direction of feed, a distance K, which is the blanking center distance between die stations. This distance is determined by adding 11/2 times the stock thickness to the greatest width to feed the blank. That is: If the blank width or length, parallel with the work strip is, say, 1 inch and the material thickness is 16 inch, then the correct blanking center distance will be 1-3/32 inch. But for very thin gauge stock, it is usually best to add two or three times the stock thickness instead of only 11/2 times, in order to make a strong "bridge" of metal between blanks for registering the strip.

The height of the stop pin is 1½ times the stock thick-

ness. The pin must be located as far toward the left as possible to facilitate tipping the left edge of the strip upward and thereby clear the pin when passing a blanked hole over it. When registering edge **H** of the blanked opening against the stop pin, as shown in the drawing, a new area of the strip is exposed for cutting the next blank. The width of the work strip has a clearance through the channel stripper plate **J** of 0.010 inch for large work such as is blanked in this die.

This die is called a "drop-through" design, because the cut blank drops through die block **F** and die shoe **A**, and then out through the bolster plate and bed of the press. When punch **G** ascends through the work strip, it



carries up the scrap frame which is then "stripped" from the punch by contacting under the roof of stripper channel J.

To attain its full length, punch G is backed up by a machinery steel filler block I. This avoids using a solid tool steel punch, and is an economy measure. Parts A, B, C, D, and E, are the die shoe, punch holder, punch shank, guide posts, and guide bushings, respectively. These parts compose the die set, which is one of the four post varieties.

Blanking Die With Spring-pad Stripper

The blanking die shown in Fig. 2 is of the same general design as the one

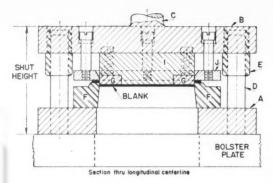


Fig. 2—Illustration showing a plain blanking die in which a spring-pad stripper plate attached with sliding stripper bolts has been incorporated.

shown in the preceding figure, except that it uses a spring-pad stripper plate **J**, around the punch, instead of a positively attached channel plate.

Figure 2 will disclose several practical advantages in the use of springpad stripper plates in blanking dies. 1. When the punch descends, the spring-pad contacts the work first and holds it flat down on the die before cutting the blank. 2. When cutting large thin metal blanks, the springpad pressure has a tendency to straighten wrinkles or waved irregularities from the sheet. 3. When blanking brittle materials such as Presdwood, thin hard rubber, and so on, holding down the work sheet with a spring pad, before cutting, prevents fracturing the blank or crumbling cut edges. 4. When the press ram ascends, the spring-pad "strips" the scrap from the punch without disturbing the sheet from its position on the die, 5. The die is in full view of the operator, except at the moment of blanking, and is not hidden by an attached stripper plate channel. 6. Spring-pad blanking dies are a better design for cutting large thin blanks than any other type of blanking die. 7. A small change in design permits spring-pad dies to reinsert blanks back into the strip from whence they came, and this feature will be discussed next.

Returning Blanks Into the Strip

The blanking die illustrated in Fig. 3 provides for return of cut blanks to the work strip. For large area blanks this press tool will dispose of the blank easily where the

press-bed opening is too small to permit the blank to drop through. In small work, the returned blank can be carried forward in the strip for progressive operations at succeeding stations.

In the sketch, the die is closed and the blank has been cut. When the press ram ascends, spring shedder **H**, underneath the blank, forces it up against punch face **G**, and continuing to ascend, spring-pad **J** holds down the scrap frame on the die, while shedder **N** pushes the blank up into the scrap strip opening. Shedder block **N** is activated by springs, or by means of an air cushion under the bolster plate, which is in contact with plate **H**.

There are several methods for removing the blanks after returning them to the strip. Large blanks, cut in a straight-side press, are knocked out by a second man at the rear of the machine. Smaller blanks can be ejected through a clearance hole by the descent of a suitable knockout punch. If the blanks are the long narrow type, with lengths positioned across the strip, they can be ejected rapidly by passing the strip over a roller.

Inverted Compound Die With Knockout Pad

Figure 4 serves to illustrate the operating principle of an inverted com-

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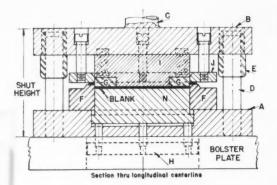


Fig. 3—The blanking die shown in this drawing provides for reinserting the cut blank in work strip on the upstroke.

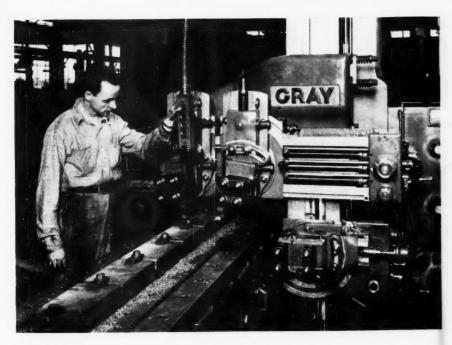
pound die having a knockout pad. Here, the punch is attached to the die shoe, and the die block directly above it is attached to the punch holder. This die is used in presses where the opening through the press-bed is too small for "drop through" blanks. Another feature here is the easy method of disposing of the blank. Both the punch

and die are built up to the desired height with cold-rolled steel blocks, thus saving a substantial amount of tool steel.

The coiled compression springs located beneath the stripper-pad are not placed

around the stripper screws, but are located in their own recesses, as shown. This arrangement permits the use of longer springs than would be possible if they surrounded the screws. Coiled springs will "stand up" best when not compressed more than two-thirds of the difference between their free lengths and solid heights. In low







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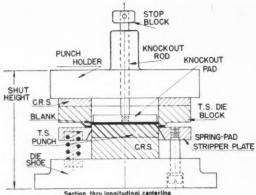
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This die shown in Fig. 4 can be used on a bolster plate having no openings, and on a press of minimum-size bed opening. Therefore, for heavy duty work, this design eliminates much of

exceeded when using long springs.

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Fig. 4-Inverted compound blanking dies are used on presses wherein the press bed opening is too small to permit the blank to drop through. The scrap frame is stripped from the punch when the ram ascends by the action of a spring padstripper plate.

the usual "tool spring," "spongey" conditions, and vibrations which are so noticeable in conventional "dropthrough" blanking dies. In this tool, the "build up" under the punch, where greatest blanking pressure occurs, is

solid steel.

When the press ram ascends, the blank having been cut into the die. is ejected by the knockout pad and its attached rod, at the moment in ascent when the stop-block contacts the knockout bar across the press head. The stop-block prevents the pad from falling out of the die, and also protects the mechanism in the die if the knockout bar is inadvertently set too low while making the die setup.

The next article in this series will continue with a discussion of compound piercing and blanking dies.

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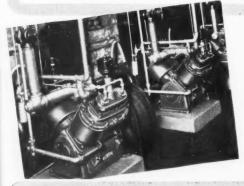
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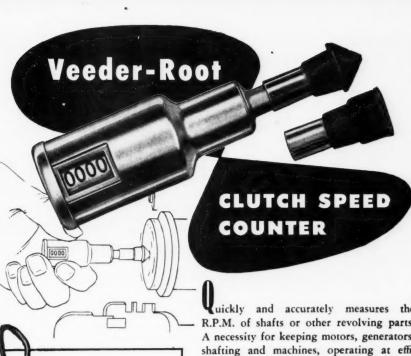
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Practical Pointers on Steel Treating Part VI

W. R. Bennett

In this article the author discusses cold header dies, re-hardening, oil-hardening manganese steel, and quenching baths.

By W. R. BENNETT

TOUGH, straight carbon steel containing 80 to 90 point carbon is, in the opinion of many users, best adapted for cold header work. Alloy steels containing chrome, nickel, tungsten and vanadium have been used but except in a comparatively few specific cases, the manufacturer returned to the straight carbon stock, inasmuch as his experience has convinced him that a properly heated and hardened header die made from tool steel is more profitable as regards production as well as machining. The objection to the alloys appears not because of insufficient depth of hardness but because of their tendency to split as a result of heavy impact. There are a number of rivet and screw manufacturers today employing a force of die makers, greater in numbers than the entire output of finished product warrants. This condition is due to the fact that a sufficient amount of attention has not been devoted to the hardening operation. If the hardener is an intelligent fellow and is working for the best interest of his employer, he will see the advisability of systematizing his work and take the initiative

by getting down to hard facts before notified to do so by his superior.

If the maximum production of a correctly hardened pair of header dies is a million pieces, there can be no good reason or excuse why a similar set of dies of the same analysis should fail with the first thousand blanks. It would appear that common sense would tell us that an investigation was in order. This condition, however, does exist in many places. It necessitates the employment of an excess force of die makers and also increases the work of the hardener.

In order to change this condition and bring about better results, the hardener should cooperate with the production foreman. Each pair of dies should be marked with a distinguishing number. A record of primary heating temperature should be tabulated, as should also a test for hardness be made on each piece both after hardening and after the temper has been drawn. The reason for testing before the temper is drawn, although the dies may all be drawn to a uniform degree, is that they may not show uniformity in testing, because of possible ununi-

formity of hardness prior to the drawing operation.

The hardener should keep a simple card record of all of these operations and should require from the production foreman a report of the amount of work performed on each set of dies. This report should be tabulated on the hardener's record for future guidance. Header dies are subjected to double duty, inasmuch as they are required to withstand shock and great pressure. It is essential, therefore, that the depth of hardness, especially at the working points, is sufficient to withstand the blow. Many times sinking develops at the bottom of the impression of a die. This sinking is immediately accompanied by cracks in the impression. These cracks develop because of insufficient depth of hardness penetration. The reasonable assumption might be that the die was too hard. If after hardening another pair and reducing the hardness, the same

result occurs, we are brought to the conclusion that the grade of steel does not apply to this nature of work.

Well, let us see. The dies sink and then crack. Inasmuch as heating instructions have been carried out, we have produced as fine a granular construction as this particular steel will develop. The hardness tests have proved satisfactory. If this steel were treated in a like manner and made into a circular forming tool, it would undoubtedly stand up and give excellent results. We must bear in mind that a cold header die is not a cutting tool. It must withstand pressure and a blow. The advice given by the steel manufacturers pertinent to temperatures for the primary heating is correct and does develop satisfactory hardness readings and applies in the majority of instances. It does not, however, apply to the correct hardening of cold header dies.

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header dies. These dies are made for cold heading one half inch chrome carbon balls. They are two and one half inches in diameter, about three inches long and have a carbon content of .85. We heat these dies to the temperature advocated, possibly 1450 degrees Fahrenheit. We then introduce into the impression sufficient cooling medium to warrant hardening at the point required. Can we expect these dies to give required service? By no manner of means. These dies will sink and crack in the impression. Insufficient depth of hardened crust is the answer. We are not interested in grain size; we must sacrifice fine texture for increased penetration of hardness.

Suppose we heat another set and instead of heating to 1450 degrees Fahrenheit we heat to 1600 degrees Fahrenheit. We follow through with the identical quenching method. We are rewarded with a set of dies having a much greater depth of hardness penetration-a set that will give good service and will not sink and crack.

Header dies do not sink in the impression because of excess hardness but because of insufficient depth of hardened surface. They crack because of the same reason.

Re-Hardening

The question is often asked, "Do you believe the chance of successfully hardening the second time is as good as the first?" If a die has been hardened correctly, performs its full quota of work, it is quite evident the die contained no internal imperfections such as seams or pipes. Invariably pipes have a habit of making themselves prominent at the first hardening. If they are not in evidence, it is certain that they do not exist. This, in itself, assures the chap who hardens it the second time, "If it has been successfully hardened the first time, I can do it again."

There is, however, an intermediate



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This and other fine features of the "American" Pacemaker are thoroughly covered by Bulletin No. 16.



operation prior to the second hardening which must be attended to. It is necessary to anneal the die in advance of the second hardening. Many times, as a result of improper care and attention devoted to this necessary phase of the operation, dies are spoiled before they reach the re-hardening step. It is understood that more heat is required to anneal an unhardened piece of bar stock than is essential to anneal a previously hardened piece. The majority of men performing this work do not appear to realize this, consequently they persist in heating a hardened piece for annealing equally as hot as was required for the hardening temperature. This is a mistake and should be discontinued. Under no circumstance should a hardened piece of straight carbon or a hardened piece of oil hardening manganese steel, if it is to be worked over and subsequently hardened, be heated within 150 degrees of the hardening temperatures for annealing.

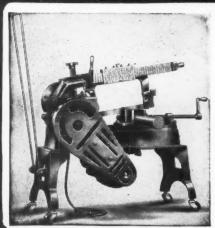
We are agreed that pre-heating an unhardened piece prior to hardening is advisable. In the annealing step it is much more necessary to preheat a hardened piece slowly before subjecting it to increased temperature, thus eliminating the danger of sudden expansion and cracking. There are many more dies spoiled during this intermediate annealing step than ever reaches the attention of the governing powers.

No, I do not believe, provided the advice as given here is followed, there is any more danger in rehardening than in primary hardening.

Non Changeable Oil Hardening Manganese Steel

It is supposed that the "NonChangeable" oil hardening steels are so called because of their ability to withstand heat treatment without change. Unquestionably, the alleged qualification is a misnomer. Manganese oil harden-

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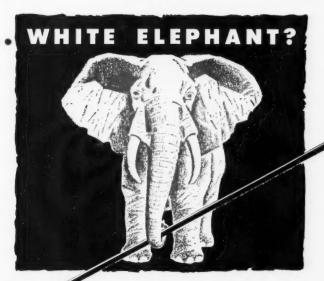
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COLD DRAWN STEELS

ing steels do change as a result of heat treatment, not however, to the marked extent as do water quenched straight carbon steels. There are no methods yet devised to control it in the quench and it is more susceptible to surface cracks as a result of grinding than is carbon steel. It also shows a very marked tendency to soft exteriors, although hardening temperatures and time for heating in each case may have been correct.

Cause and Prevention of Soft Exteriors Experienced with Treated Oil Hardening Manganese Steels

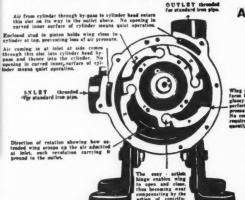
During the past, quite a considerable amount of trouble has been experienced as a result of soft exteriors when oil hardening manganese steel has been hardened. This condition is not in evidence when small pieces are being heated for only a short time. The larger pieces that must be subjected to hardening temperature for a much

longer period are the culprits.

The steel manufacturers and also the steel sales organizations are aware of this fault and it appears that many have been rather tardy with advice that tends to be helpful. It does not follow that all advice pertaining to this subject should be taken as absolute fact, as is evidenced by a recently published article appearing in a pamphlet of instructions. The comment is as follows: "All oil hardening steel seems more prone to surface de-carbonization than water hardening steels. This is important because it probably has a great deal to do with explaining otherwise mysterious inequalities in production. There is no specific for its prevention, unless the piece can be ground all over after hardening. Its control is a problem for particular tools in particular plants."

Attention is brought to the foregoing quotation, because we are, some of us, inclined to take the other fel-

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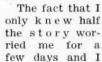
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low's conclusions as gospel and do not make the effort to analyze for ourselves. Actually, there is not the slightest mystery involved. There is a specific for its prevention and it is not a problem for particular tools in particular plants.

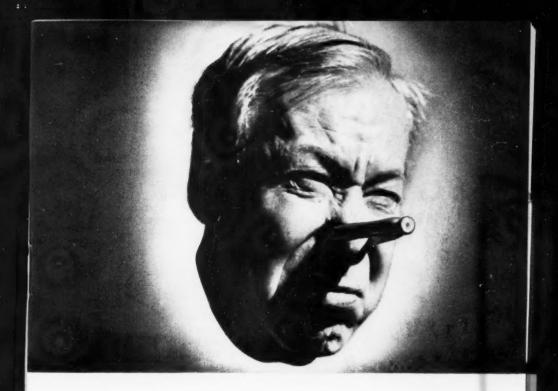
It is an easy matter to attribute soft exteriors to "Decarbonization." Decarb however is not the answer. It might be well for us to consider the exact opposite. This condition is the result of faulty atmosphere.

Some time ago, a leading metallurgist representing one of the large steel producers of the country, visited me. He handed me a shell roll and said, "Bill, here is a roll made from our straight oil hardening steel. It has already been through the hardening process. It is, however, useless inasmuch as it is so badly decarbonized. I would like you to reharden it, but it will first be necessary to remove the oxide or decarburized surface, otherwise, we will have the same condition."

The piece was carefully annealed, pre-heated and placed in another oven and heated to 1430 degrees Fahrenheit. It was then quenched in oil. Temper was not drawn. It was then tested for hardness and Rockwelled 63 C. over its entire periphery. I then handed it to him and asked "Well, was that Decarb?" He replied "No, it could not have been, but what was it? I noticed that you did not remove the primary oxide." I was forced to reply, "I do not know." I did, however, know how to prevent its recurrence but was unacquainted with the technical rea-







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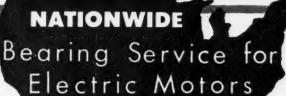
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finally wrote a metallurgist friend in Hartford, acquainting him with the entire story and requested information. The following is taken from his reply. "A highly reducing atmosphere tends toward a carburized surface, thus throwing out of balance, carbon and managnese with a resultant slightly Austinitized surface being produced, consequently soft to the file. A fire running close to the dividing line, possibly on the lean or oxidizing side, will develop a Martensetic structure, the hardest known micro constituent, and the piece after hardening will show no evidence of soft exteriors."

An Interesting Experiment with an Oil Hardening Manganese Die

There are times during a steel treatter's experience when he is confronted with unusual jobs which force him to bring into play all of the intelligence at his command. Such a job was handed to me, with the request I harden and insure it for \$100.00 against cracking. This represented a die made from straight oil hardening steel. The dimensions were twelve inches wide, twelve inches long and one eighth inch thick. No work had been performed in the area one inch from the edges on all sides, but from those points, there were perforations representing ferns, flowers, wreaths and other forms I do not recall. In appearance, it looked as if it might be intended to blank paper doilies. The possibility of heating this die on a furnace oven floor without resulting in distortion was remote. An oil quench was considered equally hazardous due also to certain distortion.

The die was suspended in a pot of 98 per cent sodium cyanide heated to 1250 degrees Fahrenheit. Anhydrous ammonia, under pressure, passing through a small diameter pipe, was introduced to close proximity to the bottom of the bath. Immediately it entered into the bath, it became nascent and formed a catalysis. The hydrogen,



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ORDER from your local Johnson Bronze distributor, or from the Johnson branch near you a lighter gas, rose to the surface of the bath and ignited on contact with the air. The nitrogen, aided by that which was already in the original bath, succeeded in nitriding the die. The die was allowed to remain in this bath for thirty minutes. It was then removed and suspended in the air until cold and finally cleaned in warm water. This process produced a file hard die free from distortion and also free from cracks. Temper was not drawn.

Quenching Baths

Every experienced hardener is aware that if brine is used for quenching and its temperature is raised to the boiling point, it will not harden steel suitably. They also know a few degrees rise in temperature of the bath does not appreciably affect hardening. If a tank holding 300 gallons, either round or rectanglar, is employed, all of the tools quenched therein in one day would not increase the

quenching medium to a boiling point. With continuous quenching however, there would be increased heat at the surface of the bath and the method of hoeing up the water from the lower part of the tank would be advisable.

It is not necessary to maintain agitation in the quenching medium when taps, reamers, milling cutters and blanking dies are being quenched. The operator sees to it that the piece is moved sufficiently to assure of new cooling medium constantly contacting the piece. The only time a cooling bath must necessarily be kept in motion is when a flat or round surface must be hard in its entirety and this motion



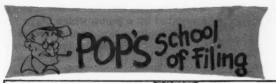
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must be augmented by the use of force, generated by a pump which plays the cooling medium against the surface to be hardened and dispels steam vapors. It is quite true that the quenching bath should be free from acids or grease.

With reference to quenching oils, it is agreed that pieces quenched from a cyanide bath or a heating bath containing cyanide should be quenched in a mineral oil, preferably fuel oil. From this, one would be led to believe that the fuel oil quench is not detrimental. If steel can be hardened by the use of fuel oil sufficiently to reveal a satisfactory Rockwell reading and the oil does not appear to cause cracks to a greater extent than do the high priced oils on the market, why not use it? Fuel oil, the same as used in heating furnaces, was employed in my plant for quenching purposes exclusively.

The oil was never allowed to reach a temperature of over 120 degrees Fahrenheit. After it had been used for a time, perhaps two months, it was pumped back into our large supply tank and burned in heating furnaces. This oil, we can appreciate, would not, in the condition it is received, be suitable for drawing the temper, due to its low flash point. We know, however, that practically all of the higher flash test drawing oils are made from a mineral base and that they are refined by heat.

We found that it was much cheaper to make our own tempering oils from fuel oil by first heating a 200 degrees flash point oil to 170 degrees, allowing it to cool, reheating always at a higher temperature, a number of times, finally succeeding in burning out the volatile matter and obtaining a tempering oil capable of reaching higher temperatures without flashing.

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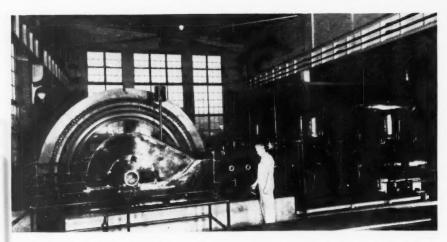


Fig. 1—This double 8000 cubic feet per minute compressor is the mainstay of the Ford Motor Company's plantwide compressed air system.

Compressed Air - An Important Aid in Forming Operations

Data and photos for this article were obtained by the Compressed Air and Gas Institute through the courtesy of The Ford Motor Company, River Rouge plant, Dearborn, Michigan

By BARTLETT WEST

DURING moments of extreme optimism, a production engineer will claim that well over 70 per cent of the more than seven thousand parts of the modern automobile are the result of pressed steel work. Although such a figure cannot be regarded as being overly accurate, it does bring out the importance of press work in the fabrication of automotive parts. It is a safe wager that a majority of the parts and panels of the all-steel body come from dies, as do all of the frame members as well as motor brackets and sup-

ports. All in all, the auto manufacturer leans heavily upon his press shop to keep production rolling.

And the press shop leans heavily upon the use of compressed air to expedite material handling, press and die operations and other similar functions. Take, for instance, the impressively large Pressed Steel Building of the Ford Motor Company's River Rouge plant in Dearborn, Michigan, where thousands of parts and panels find their way daily from the dies of the press shop to the finished motor car.

The press shop is an important factor in overall plant operations, and one of the largest users of compressed air. Together with the production foundry, the press shop utilizes over 85 per cent of the total capacity of the plant's sup-

ply of compressed air.

Because a plant as large as the Ford River Rouge unit finds so many uses for compressed air in its many buildings and departments, an extensive system is necessary to maintain desired production levels. The River Rouge plant has a plantwide system of 27 stationary compressor installations, which maintain a 63,560 cubic feet per minute capacity and a 100pound line pressure. The system is built around a large duplex tandem 8000 cubic feet per minute compressor, shown in Fig. 1, and a number of substations of smaller booster units are located where the demands are the highest. Since the Pressed Steel Building must maintain a constant and as high a line pressure as possible to insure that production standards can be

maintained, additional compressor units are located nearby, and many of the larger presses have small compressor units built into their bases. These latter units are held as reserves when construction or maintenance work causes the line pressure to drop below 75 pounds.

Just what does the Pressed Steel Building do with the air it uses? Pressed steel applications of compressed air, as shown in Figs. 2 and 3, are many and varied, but they can be broken down into the following general divisions; (1), operation of air cushions which add a second motion to presses: (2), material handling in and out of the press and between presses: (3), operation of certain types of dies utilizing air instead of springs; (4), operation of press clutches and as press counterbalances; (5), operation of pressure gauges and controls; (6), spray painting (shown in Fig. 4); and (7), cleaning and maintenance of the presses and the building itself.

Most presses are constructed with



Fig. 2—The utilization of an air pad and pins in the bed of the press has added a second motion, which is necessary for deep drawing of panels.

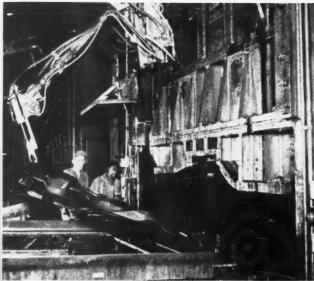


Fig. 3—Employees at Ford Motor Com-pany's pressed steel building at the Rouge plant watch as an air - activated iron hand pulls a Ford floorpan from a huge press. Even as the finished stamping is removed from press, another steel blank is inserted, ready to be pressed. This is one of the many "automation" operations that the Ford Motor Company has recently installed in manufacturing operations.

one directional force, which is in the direction of the vertical motion of the slide. However, the addition of an air cushion to the bed of the press adds a second motion to counterbalance the direction of the slide. When the punch slide completes its downward motion and air is admitted to the cylinder, the punch slide moves upward and the air in the cushion cylinder moves the piston until it is level with the bed of the press. For this purpose, Ford die engineers utilized the movement of the piston by incorporating pins which

ride on the piston and on the stripper pad of the die, and their movement causes the

stripper to rise with the cushion. The stripper serves two very important functions. It holds the outer section of the sheet steel in place while it travels downward over the inner punch, enabling the die to do closer and more accurate contour formation and causing the metal to flow, making possible deeper draws; and it clears the part from the punch on the upward motion.

Sheet metal in any form is awkward to handle but here again the die engineer calls upon compressed air to ex-

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DUO-FLEX 5 H.P. 500-3500 (Gear Shaft) 3000-15,000 RPM (Motor Shaft) \$52.60

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Fig. 4 - After all pressed steel fabrication and assembly operations are com-pleted, the 1949 Mer-cury body passes through a paint spraying booth, where compressed airspraying units equally distribute the many coats of paint evenly and thoroughly.

pedite his work. In removing small parts from the die, he merely blows them out the back by adding air fittings and an air hose to the die. The

air is automatically cut off when sheet stock is added. Air flows through the die when the press starts downward. and when the upward motion is

started the new part is blown out the back into a waiting basket.

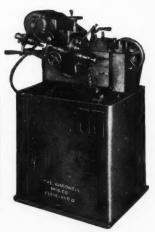
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JOB FACTS

Operation — Semi-finish, 5 per load, 10 D.P., 3.696" O.D., 27 T., 61/4" cut. Material — SAE 1137 steel Hobs — B-C Double Thread 4" x 4" x taper bore

FI-to-FI — 20 minutes per load Feed — .051"/rev Speed — 139 RPM Tool Life — 200 pieces per sharpening

Barber-Colman Company

General Offices and Plant, 3519 Loomis St., Rockford, III.

MORE FACTS

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the case of large parts other methods are used. In the case of large panels such as a roof or rear quarters, air cylinders are secured to the bottom section of the die and cross bars shaped to the contour of the part are set from cylinder finger to cylinder finger, forming a carrying cradle. Once the press has completed its cycle and the part is ready to be removed, air is introduced to the cylinder, driving the piston upward and moving the part into position for easy removal. The next part is placed upon the cradle and the air is drawn out, lowering the part into place on the die.

Air finds a similar use at Ford in its new automatic conveyor system, which carries production parts from press to press, creating a progressive and unbroken movement of operations. The cradles carrying the parts are air-op-

erated in the same manner as the part lifter of the die. Cylinders are used to lift the parts and place them on the cradles and to place them into position on the next press.

A highly specialized and rather limited application of compressed air in pressed steel work is its use in driving cams into place in cam dies. In the automotive industry, where body panels must have deep drawn contours, holes and trim edges must be worked at angles varying from the normal direction of the press. The die engineer must find a method of utilizing the normal motion of the press to do work in other directions. The answer lies in setting up a series of sliding



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cam blocks set at certain desired angles. The trim steels and piercing punch units are set on the front edges of the blocks. The rear ends of the blocks are cut at an angle of from 45 to 90 degrees depending upon the amount of desired travel. Stationary blocks are incorporated into the die punch. These blocks are cut at angles complementary to the angles of the cam blocks.

When the punch moves down, the upper blocks move against the sliding blocks, moving them forward against the part. Springs are normally used to bring the lower blocks back to their normal position; however, Ford Motor Company has found that air can do the job better and without breakdowns. By building the air cylinders into the base of the die, compressed air is utilized by setting the driving pistons of the air cylinders into the lower blocks. Air is brought into play when the press cycle is completed to force the piston forward to bring the block back into place for the next press cycle. The air then flows into surge tanks to be put back to work upon completion of the cycle. The chief advantage of compressed air as a power agent for cam return is that it exerts a constant, unvarying force and it does not require extensive servicing or replacement. Die breakdown and repair is expensive both in lost time and in direct cost.

The utilization of compressed air in cam die construction is not a new process, but its acceptance by the entire automotive industry is still to be accomplished. Slowly the rest of the industry is coming around, however, and like the Ford Motor Company, is putting research engineers to work to make full use of air in the press shop.

"Gusher" Coolant Pumps, available in models to meet all metal-working requirements, are illustrated and described in a catalog issued by The Ruthman Machinery Co., 1817 Reading Rd., Cincinnati, Ohio. Copy free upon request.

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How the New Thread Standard Affects *You*

The Adoption of a New Thread Standard Would Normally be Followed by a Difficult Transition Period. It is Fortunate that Through the Farsighted Planning of the Unification Committee, the Old and New Thread Standards are Interchangeable.

By HERMAN H. LIND

President, American Institute of Bolt, Nut, and Rivet Manufacturers

N OW that the American Standard for Screw Threads has been adopted (page 110, May 1949 issue of Modern Machine Shop), it becomes an operating problem for the producers and users of fasteners to adjust themselves to the new standard. This adjustment is not an easy matter, but it can be handled in such a way as to reduce tremendously the difficulties if the problems are recognized and willing cooperation of consumers, fastener producers, and tool manufacturers is achieved.

The broad general publicity which followed the Declaration of Accord on the Unification of Screw Threads, signed by representatives of the United States, the Dominion of Canada, and the United Kingdom, has aroused many questions among the producers and users of threaded fasteners. It is the purpose of this article to set forth the principal questions that have arisen and to answer them in a nontechnical way.

Why a New Standard?

During the first World War, when equipment of all types produced in the different countries was in the field or in the repair shops, much difficulty was had with mating threads that did not fit. This was especially unfortunate where parts with tapped holes, such as castings, were involved and where a screw of the proper nominal dimension but with a different thread form was at hand. Because of this, discussions took place immediately after the first World War; before a conclusion was reached, however, World War II became imminent, and the same and more difficulties were encountered.

Toward the close of World War II, aggressive action on the part of the representatives for the three countries and of the recognized standardization bodies again started negotiations which have just been completed. This resulted in the signing of the Declaration of Accord on November 18,

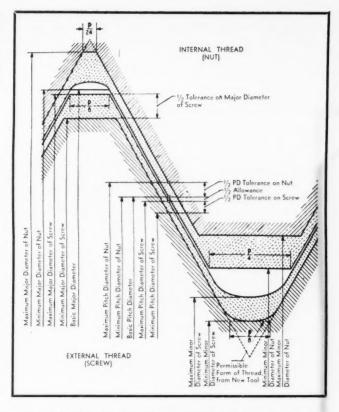
Drawing shows Class 2A, and 2B tolerances, allowance, and crest clearances. These classes are the recognized standards for the normal production of bolts, screws and nuts. (Drawing not to scale.)

1948, which applies to international specifications. This unification of threads is the principal reason for a new standard.

There is also a requirement for new standards in American threads for the following reasons: the dimensions of threads in bolts and in tapped holes, whether a nut or a casting, have developed over the years to very precise

measurements. One of the difficulties arising from these fine tolerances has been that the threaded parts may approach the same basic dimensions. A nut thread made to the minimum allowed limit, and a thread of a bolt made to the maximum limit may not assemble well. The new American standard corrects these faults by introducing a minimum clearance between mating parts and at the same time provides for international interchangeability.

Another reason for a new standard is that it corrects many of the production troubles of the old system. Often, under the old system, the tolerances of the product were practically absorbed



by the combined tool and gage tolerances, leaving little for a working tolerance in manufacture. Somewhat greater tolerance is now provided for nut threads, which heretofore have been penalized. Relatively more tolerance is provided for fine threads, which are more difficult to hold to size than coarse threads of the same pitch, because of their larger diameter and greater length of thread engagement. In cases where present tolerances were more liberal than is required in manufacture, they were reduced.

The new thread series also lays the groundwork for simplification of thread requirements. Insofar as fasteners go, in the past we have had Class 1, Class 2, Class 3, Class 4 to some extent, Class 7 fits for high temperature bolting, and a variety of customer specifications for undercutting of bolt threads for plating. It is hoped that under the new system, one class of limits may eventually replace all of this variety—at least in the great majority of cases. This new thread class for fasteners is designated Class 2A for bolts and Class 2B for nuts.

What Is Different?

Probably the main difference between the old standard and the new unified standards, so far as the American Standard is concerned, is the correction of these recognized faults. This is accomplished by providing for a minimum clearance between mating threads. Thus the new standards prevent tight fits during wrenching and

seizure at high temperatures, and allow room for plating. The high precision quality of threads is retained. These necessary corrections in thread dimensions and tolerances were accomplished while working out the basic principles of interchangeability between the three countries.

The principal obvious differences between the British and American standards are twofold:

1. The British have long used a 55 degree angle, and the Americans have used a 60 degree thread angle. Since either thread angle gave a perfectly good thread, it was reasonable to adopt a 60 degree angle by reason of the vastly greater number of 60



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Photo shows Nichols power feed attachment installed. In this case, work is held in an air-operated vise

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degree angles produced and in use.

2. The use of a rounded root and crest by the British will continue, but the shape and dimension of the thread were so adjusted by the engineers of the three countries, that an American flat bottom thread will fit its mating part in a round bottom thread and still have a good strong connection. A relatively short use of the production tools of flat bottom threads will wear the flat corners round to some degree.

Is Fastener Strength Affected?

One of the first questions that arise in connection with the new standard concerns the strength of a bolt and nut having a new thread as compared to the old. The answer is that the change does not affect the strength one way or the other in holding power: in fact, bolts made to the old or new British standard and bolts made to the old or new American standard are all equally strong fasteners.

Is Fastener Assembly Affected?

In all cases the new American standards can be assembled with the old American threads. This is fortunate, because the procurement of gages and tools and using up stock will take a relatively long time. The producers of fasteners will naturally introduce into their production lines the new tools needed for producing the new threads, as fast as the old tools wear out. That is about as fast as the gages and tools can be produced. Most users can accept the new threads in lieu of the old without any trouble. Where Class 2 or Class 3 of the old American standard tolerances is now specified, the user's specifications should permit the supplier the option of furnishing Class 2A for bolts and Class 2B for nuts when, as, and if available. These Classes 2A and 2B are the recognized standards for the normal production of



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bolts, screws, and nuts.

It should be remembered that the differences in the dimensions between the old and the new American Standard are, in most cases, extremely minute—so much so that only with close gages in the hands of experienced men can the differences be shown. Some idea of the minuteness of the thread allowances and tolerances is illustrated by the accompanying drawing of the Classes 2A and 2B thread flanks.

Should the New Standard Be Specified?

Since the new standard is adopted, it should come into use as rapidly as feasible and should be specified, but with these reservations:

Where the screw is to be assembled into a precision tapped hole and where a wrench-tight stud fit is desired, a definite statement to that effect should be made by the purchaser, so that he

may be sure the manufacturer will furnish what is expected. If the assembly is with a nut or in a tapped hole where a free fit is desired there are few, if any, cases where either the new or the old standard thread would not be usable and fully satisfactory. It is not practical or possible to go instantly from the old standards to the new. Specifying the new standard and accepting either the old or the new will speed the transition period and make it less costly for all concerned, because the new tools and gages can be introduced into the production line as the old ones are worn out. This also permits the tool and gage makers to go about producing the new in an orderly and efficient way.

Are Present Fastener Stocks Obsolete?

The answer is "No." This again is because the limits of the old and the new are such that assemblies can be



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Fig. 1 shows the machine just after finishing a load of four blanks in around one minute cutting time. The operator is about to remove the finished gears. Fig. 2 shows four finished gears, four of the blanks from which they are cut, a Shear-Speed tool head as it looks from below, and one of the single point form tools used in the head.

To change tools, the head is lowered slightly, the tools are slipped out, and another set is inserted. Tools are sharpened by grinding the top face to master gage height on a surface grinder.

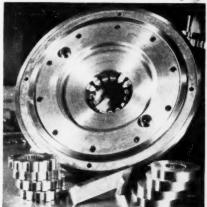
Practice is to remove a set of tools each day, or after each 1200 pieces, for sharpening. Theoretically, somewhat longer tool life per sharpening could be obtained. However, this would call for removing tools for grinding at irregular periods.

Material of the gear is SAE 1115, heat-treated after cutting. The part is used as a ratchet lock for a handbrake inside an automobile transmission.

For Shear-Speed machine details, write Michigan Tool Company for Bulletin SS-48-3.



Fig. 1 ↑ Fig. 2 ↓





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made without interference. It would be extremely wasteful and unnecessary to scrap present stocks.

Avoiding Difficulties During the Transition

It is absolutely essential in the transition period that the inspection of the product, both by the producer and user, shall be for the usability of the product rather than for the last nicety of dimension.

It is extremely important that there be a perfect understanding of this, or trouble between vendor and buyer could be unending. No producer wants to furnish fasteners that do not perform their full function, and during this period when so great a burden for the advancement of the national and international welfare is thrown on the fastener producer, the user will help immeasurably in recognizing and in making effective this reasonable policy of inspection for usability. The very considerable expense to the producer and, therefore, the additional production costs, can be appreciably minimized and many irritating difficulties can be avoided by close cooperation of the engineering and inspection departments of the producers and users.

The advantages of these three countries working together on major problems cannot be exaggerated. The same spirit of cooperation between the producer and the user during the transition from the old to the new threads will save time, effort, money, and trouble and will continue to ensure strong joints in assemblies.

Hauser Profile Projector. An illustrated bulletin presenting complete details and specifications on a profile projector for use by manufacturers of machines, tools, gages, precision devices, watches, and instruments is now being distributed by the Hauser Machine Tool Corp., Manhasset, N. Y. Copy free upon request.



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Fig. 55 Shank Type End Mill for Cast Iron

Fig. 41 Shell End Mill with High Speed Steel Blades

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Fig. 67 Face Mill for Steel

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By THOMAS TRAIL

MICROMETERS are worthless as measuring instruments if they are even slightly inaccurate. For this reason, it is important that micrometers be given proper care and intelligent maintenance so that their original degree of accuracy may be retained and so that their periods of usefulness may be prolonged.

Of course, every machinist knows



Fig. 1—A toothpick or a whittled match stick may be used to apply oil to the threads of the fixed nut.

that a micrometer should never be used as a clamp, that it should not be dropped or thrown into a box of heavy tools, that it should be used gently and never forced when taking readings, and, generally, that it should not be used by more than one person. Perhaps it might be well to mention that a micrometer should also be carefully protected from abrasive and metal dust, that it should be protected to prevent rusting, that it should not be placed on or near hot objects, and that it should be kept clean at all times.

If abrasive and metal dusts produced during grinding and filing operations are carried into the threads and other operating parts of a micrometer, wear and jamming of the parts will result. Rust, too, should be prevented as much as possible because of its extremely detrimental effects. The best method of protecting a micrometer from rust is to keep the instrument away from water, steam, or other vapors, and, while not in use, to wrap it completely in a cloth that has been moistened slightly with lubricating oil and keep it inside a box or case. Exposure to excessive heat will usually have a damaging effect on a micrometer; heat may alter the accuracy of the instrument, it may cause the metal parts to change color, or it may carbonize the lubricant and cause jamming of the parts. The reason for gen-



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STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.



Fig. 2—Method of tightening the adjusting nut on the end of the fixed nut.

eral cleanliness are obvious; if grease and dirt are allowed to accumulate on the surfaces of a micrometer, some of the abrasive substances may be carried into the operating parts and produce excessive wear.

A micrometer which is in daily use should be checked for accuracy and lubricated every three to six months. The first step in this checking and lubricating procedure is to clean the measuring surfaces carefully. This cleaning is done by bringing the measuring surfaces in light contact with a piece of soft paper and pulling the paper between the surfaces. In a zero-reading micrometer, the accuracy of the instruments is then checked by moving the anvil and spindle together with the same moderate pressure as is used when taking measurements, and noting whether or not the instrument reads zero properly. If it does not, adjustment will be necessary.

For a micrometer whose spindle and anvil are designed not to come together at the zero reading, a different, yet similar, technique is followed for checking the instrument. In addition to the spindle and anvil surfaces, the surfaces of the test gage, or standard, are also cleaned carefully. The standard is inserted between the spindle and anvil, light pressure is applied to close

14 NICHOLSON EXPANDING MANDRELS REPLACE 209 SOLID ARBORS

Widely used for turning, milling and grinding, Nicholson expanding mandrels frequently demonstrate that

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BULLETIN 1043 shows how to save set-up time, promote precision with Nicholson mandrels.

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the instrument on the standard, and the accuracy of the zero reading is noted. For a micrometer having interchangeable anvils, each anvil is checked with its own particular standard.

To lubricate a micrometer mechanism, the spindle unit is first removed from the body of the micrometer. The threads of both the spindle screw and the fixed nut are next cleaned by means of a small brush which has been dipped in pure naphtha. The naphtha is allowed to dry, and then two or three drops of high grade light lubricating oil are applied to the threads of the fixed nut with a toothpick, or a whittled match stick, as shown in Fig. 1. On a micrometer equipped with a clamp ring, care should be taken never to tighten the clamp ring when the spindle is removed as this tightening action will damage the clamping mechanism.

If the contact between the threads of the spindle and the threads of the fixed nut seems loose, the adjusting

nut on the end of the fixed nut should be tightened, as shown in Fig. 2. Usually a partial turn of the adjusting nut will correct the condition: however, several trials may be necessary before the desired thread tension is obtained. When replacing the spindle, care should be taken not to force the spindle screw into the end of the nut. If the operation of the spindle seems uneven after the thread tension has been adjusted, the micrometer frame should be clamped lightly in a vise and the thimble should be rotated rapidly a few times between the palms of the hand.

Should the zero setting of a micrometer require adjustment, the method of adjustment will depend upon the type



SAVE SPACE, MAINTENANCE, COST

Simplified design of the O-M cylinder eliminates tie-rods, requires minimum space for installation. All body parts machined steel (not cast)—all bearing surfaces bronze. No bolts or screws—repacking is a matter of minutes. Continuous duty to 1,500 cycles per minute guaranteed. Simplified cushion, no ball check required. Ports adjustable to any angle. Interchangeable mounting brackets. Simplified design makes lower cost possible. Write today for details!

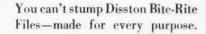
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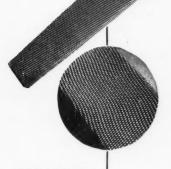
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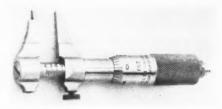


Fig. 3-A typical inside micrometer.

and make of the instrument. For example, a Starrett micrometer is adjusted by bringing the measuring surfaces together carefully with a light pressure, inserting a small spanner wrench into a small hole in a graduated sleeve on the micrometer barrel, and then turning the sleeve slowly until the longitudinal line on the sleeve is made to coincide with the zero graduation on the thimble.

The Brown and Sharpe solid anvil

type micrometer is adjusted in a slightly different manner. The spindle is first moved away from the anvil, and the thimble cap is unlocked with a spanner wrench. The cap is then tightened lightly with the fingers. Next, the spindle and anvil are brought together by rotating the spindle, and the zero graduation on the thimble is set to coincide with the longitudinal line on the barrel. The spindle is now moved away from the anvil by rotating the spindle only, and then, holding the thimble, the cap is tightened securely with a wrench. The corrected zero adjustment should always be checked by bringing the measuring surfaces together with light pressure, and, if necessary, the adjusting procedure is repeated.

The zero setting of an inside micrometer, such as the one shown in Fig. 3, is adjusted by adjusting the outer jaw position. If adjustment is



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either Index Collets or Standard Brown & Sharpe type collets.

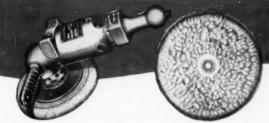
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necessary, the two screws in the outer jaw (the left jaw in the illustration) are loosened, and the jaw is adjusted until the proper micrometer reading is obtained. The screw in the underside of the jaw is then tightened, and the screw in the end of the jaw is tightened gently, but firmly, in order to prevent any movement of the jaw.

Inside micrometers of the rod type are usually provided with means for compensating for wear of the rods. In a typical micrometer of this type, adjustments are made by simply loosening a locknut, adjusting the rod point until the rod measures the correct length, and then tightening the locknut. Of course, the rod should be checked again for length. Some inside rod and telescoping type micrometers are fitted with adjustments to compensate for wear of the measuring points opposite the ends in which the removable rods are used; these adjustments are similar to those used on the measuring rods.

In all cases, whenever the screw or nut of a micrometer becomes worn sufficiently to cause inaccuracies in readings, the instrument should be returned to the factory for replacement of defective parts. When sending it away for repair, care should be taken to wrap the micrometer carefully in order to prevent breakage and to identify it properly by attaching a tag showing the owner's name and address. A letter should accompany the package giving full information on the service desired.

By devoting frequent short periods of time to the care and maintenance of micrometers, their continued accuracy will be assured, and years will be added to their useful lives.

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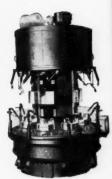
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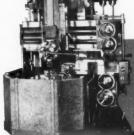
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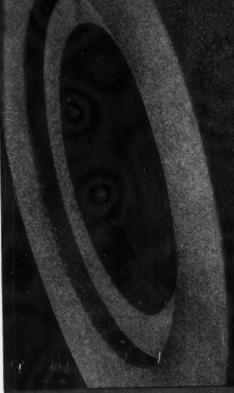


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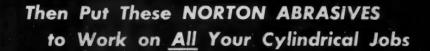
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Dillard E. Bird

A Philosophy of Human Relations, Part VI

In this Article the Author points out the Essential Features of a good Program of Employment Stabilization

By DILLARD E. BIRD

TN last month's issue, we discussed the economic, human, and sociopolitical factors making greater employment security a necessity. We stated our problem which was really two-fold-unemployment and irregular earnings of workers under our system of private enterprise in America today. We discussed one proposed solution, "The Guaranteed Annual Wage" and the difficulties inherent in such a plan. We drew distinctions between compulsory and voluntary guarantees and as our concluding statement, we pointed out that while it is not easy to regularize operations and employment, it can be done. It is our intent in this article to point out the methods which management may employ and the essential features of a good program of employment stabilization, stating our final conclusions concerning guarantees and stabilization and the most effective plan which management can follow.

Those managements who have recognized the value of regular operations and employment to their companies, as well as to their employees, have worked toward that goal. They have found that accepted management

tools, used in the proper combinations to fit the circumstances, are the keys which will unlock the doors to regular operations.

One such tool is market research. Market research has long been regarded as an effective management technique in consumers' goods industries. It is being used more and more, and with worthwhile results, in producers' goods industries as well. Effective market research provides a sound basis for planning. It shows the means of stimulating more regular demand. It provides information on the feasibility of production to stock, other factors permitting. It points the way for the development of complementary products to help bridge seasonal or cyclical fluctuations or to reverse a secular trend.

It serves as a guide in the elimination or improvement of unsatisfactory products.

No management which is attempting to achieve regular operations and employment can ignore the contributions of engineering.

PRODUCT ENGINEERING develops new products and revises old products in coordinated effort with market research.

INDUSTRIAL ENGINEERING determines the method of manufacture and develops the facilities and the controls of operations necessary to economical manufacture. Economy of manufacture enables any producer to compete more effectively—a prime necessity in continuing level operations.

PLANT ENGINEERING provides the facilities for maintaining effective-

ness in production.

PROCUREMENT. Planned purchasing of sufficient amounts of the right kinds of materials at the "right" price not only facilitates steady operations but also contributes to lower costs.

PLANNED PRODUCTION, by providing for steady operations, permits the achievement of regular employment.

PRODUCTION CONTROL is an indispensable management tool. There must be planning, scheduling, and control of every step of the entire manufacturing process. This is the only way to provide and insure a continuing level of operations.

MATERIALS CONTROL is essential to steady operations. Planned purchasing is impossible unless a careful record of inventories and the rate of use of materials is maintained. Regularity of production is impossible without the right quantities of the right qualities of the right materials at the right place at the right time.

FINANCE. Adequate working capital is indispensable to regular production. Lines of credit are often necessary to carry inventories and to meet payrolls and operating expenses.

EMPLOYEE RELATIONS within the company must be good if the program for steady operations and steady jobs is to be successful. The confidence

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Shops handling rotating parts find this simple, sturdy and thoroughly dependable device highly efficient for balancing and truing operations. It assures better work . . . saves time . . . saves labor. No leveling required.

Four chilled iron discs rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.

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20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000



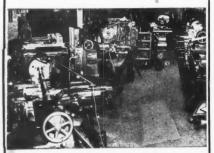


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ADVANTAGES

- M.F.P. offers extremely high resistance to oil and grease, is shockproof and provides the maximum of foot-ease and light reflection.
- (2) M.F.P. is far more grease resistant than other patching materials. It requires only ½ inch "chip out" around edges.
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- (4) M.F.P. can be applied over concrete or wood, and is of the same color as concrete.
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M.F.P.

(MACHINE SHOP FLOOR PATCH)



of workers is basic to their acceptance of any management activity.

COOPERATION AMONG BUSI-NESSES. There is an open field for the development of greater cooperation among the businesses in the effort to attain more regular operations. A company can aid its suppliers by placing advance orders and by placing orders with regularity. Some companies have even gone so far as to provide their suppliers with warehousing facilities for the storage of finished products earmarked for them.

MANAGEMENT ENTHUSIASM is basic. Only an enthusiastic management will be willing to establish the achievement of steady operations and employment as a prime objective, which position of importance it must occupy if it is to be attained.

These are some of the techniques used by management in attaining the goal of steady operations. New and unique ways of solving management problems can be found. The situation in each company is different. Concentrated study of the particular circumstances is necessary to evolve a tailormade plan which will be effective in the elimination of irregularity in operations.

The elimination of irregularity and the achievement of **stabilization**, a constant level of operations year after year, should be the goal of every company. Many benefits accrue to stabilized companies. I will list some of the most important of these benefits of stabilization.

LABOR TURNOVER. Stabilization reduces labor turnover. The costs of recruiting, employing, and training workers are lowered. A savings is effected in unemployment compensation assessments in most states. A work force composed of experienced and more desirable workers is attracted and held by the offered stability of employment. An experienced work force yields greater quantity and higher



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quality output; needs less close supervision; and has fewer accidents. The result is less interference with production and lower compensation costs.

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EMPLOYEE COOPERATION. Employees, when not worried about layoffs, are more willing to cooperate in the development and introduction of mechanical, technological, and methods improvements. Employees will be willing to aid and assist in cost saving undertakings.

WORK STRETCHING. Stabilization of operations and employment removes the principal reason for the inclination of employees to "stretch" work.

FINANCIAL STATUS. The financial position of the stabilized company is improved. The stabilized business is generally recognized as a well-managed and sound firm; therefore, credit is more easily obtained and on better terms.

PROCUREMENT. More economical buying becomes possible when operations are continuing and regular.

VENDOR RELATIONS. Vendor relations are improved. Stabilized companies are valued and preferred customers. The suppliers of a stabilized company are better able to schedule their own production and deliveries because of the regularized purchasing by the stabilized company.

SCHEDULING is facilitated and made more efficient by stabilization, because (1) it is possible to schedule far in advance, and (2) the most eco-



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organization, knowing that which it will have to sell and when the goods can be delivered, will be able to plan its activities more effectively.

CUSTOMER RELATIONS. Stabilization improves customer relations. Customers appreciate dependable service. Under stabilization the sales organization can promise deliveries and those promises will be dependable be-

cause of the regularity of production.

EMPLOY -EE RELATIONS. Under stabilization the morale of the work force is improved. Emplovee relations will be more firmly cemented. Discontent is less likely to be present. Rumors of lay-offs do not spring up, grow to distorted proportions, and cause trouble. Strikes are not easily fomented in such situations since workers are happier in more secure jobs. Management, by showing sound planning for future security, merits and receives the confidence of employees.

PRODUC-TIVITY. Stabilization helps increase worker productivity. Workers who

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PUBLIC RELATIONS. Community acceptance of the stabilized company is increased. The company offering steady jobs to its employees is an asset to a community. A community is not unappreciative of the benefits which it receives as a result of the steady jobs offered by a firm. And community good-will is priceless to the company which has gained it.

Those are the major benefits to be gained from stabilization, once it is achieved. At this point the management of the stabilized company can begin its consideration of a guarantee of work or wages. No guarantee should be offered by management without carefully weighing the additional advantages to be expected above and beyond those yielded by stabilization. The additional advantages which management may expect must be balanced against the disadvantages inherent in a guarantee. The benefits which management realized from stabilization have just been discussed. These benefits are often claimed as benefits of guarantees. In fact, they are actually the benefits to be derived from the stabilization which must precede the offering of a guarantee.

However, the proponents of guarantees claim a few advantages for guarantee plans above those benefits actually derived from stabilization.

The claim is made that guarantees

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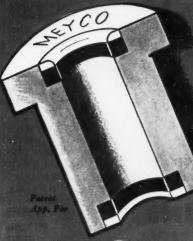


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provide certain benefits to a greater degree than does stabilization. Proponents claim that guarantees promote greater employee cooperation in methods work; remove even more of the employees' inclination to stretch work; and improve employee attitudes to an even greater degree than does stabilization. This contention cannot be considered valid. Employee cooperation, productivity, and attitudes depend upon the confidence of employees in their employer. A guarantee plan,

inaugurated without employee confidence, would be suspected by employees and failure would be likely. The offer of a guarantee **presupposes** employee confidence—it does not build that confidence. On the other hand, employees having faith in the good intentions of management are productive and have healthy attitudes without a guarantee.

The claim is also made that a guarantee will lead to savings on overtime payments under the Fair Labor Stand-

ards Act. The provisions of this Act pertaining to guarantees are very restrictive. Most companies offering guarantees have not seen fit to take advantage of the overtime savings provisions. The savings under the Act will not usually be of great consequence, because the necessity for overtime work diminishes and the potential savings are minimized as a higher degree of stabilization is achieved.

Proponents of guarantees claim that guarantees provide the employer with a more flexible work force. Some guarantee plans do provide for the ready shifting of workers from job to job in accordance with the availability of



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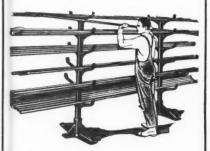
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work. However, this provision is by no means universal. A guarantee plan does not necessarily assure a flexible work force. Conversely, the absence of a guarantee plan does not necessarily imply a lack of flexibility. A flexible work force results from skillful management, employee cooperation, and good employee communications. Each of these can be equally effective under either a guarantee plan or a stabilization program without a guarantee.

Those who favor guarantees lay much emphasis on the claim that the public relations value of a guarantee exceeds that of stabilization. The present mystical (and mistaken) significance of "The Guaranteed Annual Wage" to many people cannot be denied. The skillful handling of public relations by the stabilized company, however, will make this advantage a temporary one.

Much publicity has been given the claimed advantages of guarantees, including those which actually are the benefits deriving from the stabilization which must precede a guarantee and those which are, if not completely fallacious, at least subject to skepticism. Strangely enough, the disadvantages accruing from a guarantee plan have seldom been recited.

Among the major disadvantages of guarantees is that the wages assured by the guarantee are assumed by the employer as a fixed charge. Management freedom of action, therefore, tends to be limited. The guarantee must always be considered before undertaking anything capable of causing either an increase or decrease in the number of workers employed. The guarantee must also be considered in establishing pricing policies. The burden of a guarantee may cause a company to price its products out of a market. The inability of that company to compete deprives the workers of the job security which the guarantee plan was proposed to provide.



SAVE ON PARTS—The Vers-O-Tool is the simplest die head made—only 3 main parts: body, hood and adjusting plate. Body is integral with shank; prevents wear looseness, maintains alignment. Fewer small parts to wear or replace.

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SAVE ON SPACE AND WEIGHT—The Vers-O-Tool has the smallest O.D. in relation to cutting range of any comparable die head. Both revolving and stationary styles are ideally adapted for use on applications where space and weight are a problem.

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SAVE ON SET-UP TIME—The Vers-O-Tool design is outstanding for quick diametric adjustment. Two screws move all chasers simultaneously; set-up is completed in a mere matter of seconds.

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pects to reduce operations. These limitations and the "escape" clauses of a guarantee plan may result in employees considering the plan as a retrenchment of the former management position with a consequent loss of confidence in management.

The greatest disadvantage and perhaps even the gravest danger in a guarantee plan may well be the fact

> that a guarantee removes much of the natural incentive to effective performance on the part of the individual employee. Effective human performance and effort are the result of the free functioning of man's basic drives. The basic drives cause man to strive to satisfy his wants. A man, having satisfied one drive, turns his efforts elsewhere to attempt to provide satisfaction for the others. When all are satiated, man relaxes and ceases to expend effort.

Today, man works for a medium of exchange as a means to satisfy his wants. A guarantee of continuing income leads the workman to assume the continuing fulfillment of his wants. The work-

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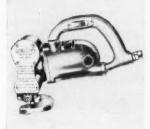
Both models deliver 80 lbs. pressure on a line pressure of 100 lbs. They'll save countless man-hours in assembly operations involving welding, riveting, bolting, etc. Advantages over mechanical clamps: 1, Any number can be operated by single master valves. 2, Easily installed in cramped corners. 3, Equal ram pressure at any stroke point. Send for new Mead AIR POWER Catalog, describing our line of Air Clamps, Air Vises, Air Presses, Work Feeders, Valves, Controls, etc.



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er, then is no longer motivated to strive and to work. He relaxes. The natural result is decreased expenditure of effort and a tendency toward lowered productivity which can be counteracted only by superior management. Steady jobs are important. Excessive job security, however, is not compatible with a high level of production.

Summary

In summary, let me point out that the proponents of guarantees attribute many advantages to guarantee plans. However, many of the advantages claimed for guarantees are actually the values accruing from the stabilization which must precede a guarantee. The advantages claimed to result from guarantees over and above those tendered by stabilization, if not invalid, are transitory. Stabilization offers all of the important benefits of guarantees with few of the penalties. The

answer to the need for steadier jobs is stabilization. Many companies have already achieved a high degree of stabilization. Some have offered guarantees. Many have not.

We want worker security. Worker security is the direct result of stabilized operations. We can, with stabilization, fulfill that want and obtain all of the important benefits for business, for workers, and for our economy. Guarantees of work and wages added to stabilization are, at best, window dressing which poses new problems. The positive contribution of a guarantee to the stabilized company, which has fully utilized its stabilization, is inconsequential.

Here are the six conclusions which I have drawn:

 A greater degree of stabilization can be achieved in all companies through the concentrated effort of skillful management.

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 Stabilization must be a part of a wholesome management program.
 It is not a substitute for and cannot be achieved in the absence of sound management practices.

 Stabilization must be the culmination of the sincere efforts of management to meet the social obliga-

tion of business.

 Stabilization must be achieved for the benefits which it offers to employers and workers.

 Stabilization must be attained throughout business for the survival and realization of the full potential of our economic system.

 Increased stabilization on an ever wider front will help solve our greatest problem—that of providing employee security.

"Lincoln Weldirectory for Stainless Steel." The Lincoln Electric Co., Cleveland 1, Ohio, now has available a sixpage bulletin presenting illustrated, descriptive, and tabular information on electrodes for the shielded arc welding of 18-8 stainless steels and for surfacing with d.c.; for the shielded arc welding of Type 309 stainless steel with d.c.; for the shielded arc welding of Type 316 stainless steel with d.c.; for the shielded arc welding of Type 316 stainless steel and for surfacing with d.c.; and for the shielded arc welding of 5 per cent chromium steels. Copy of Bulletin 463 free upon request.

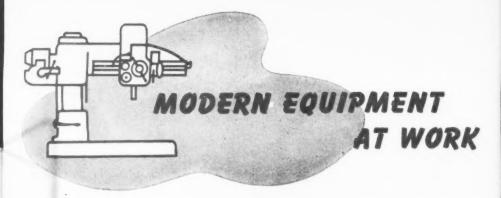
"Cleaning Problems Solved in the Reconditioning of Steel Drums" is the title of an illustrated eight-page bulletin prepared by the American Wheelabrator and Equipment Corp., 555 S. Byrkit St., Mishawaka, Ind. Data provided in the bulletin include an explanation of the importance of thorough drum cleaning for good adhesion of paint or organic coatings; explanations of the Wheelabrator method; and complete descriptions of the performance and operation of Wheelabrator machines installed in typical reconditioning plants. Line drawings and descriptions are also included to illustrate each of the types of Wheelabrator machines designed for specific cleaning requirements. Copy of Bulletin No 574 free upon request.



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Changes in Hob Design and Manufacturing Methods Solve Problem of Noisy Gears

THE problem of a noisefree elevator propulsion gear mechanism has been the subject of considerable study, research, and experimentation over a period of years at Westinghouse Electric Elevator Corp., Jersey City, N. J. Originally, the company used internal and external spur gears accurately cut from cast iron and steel blanks. However, these gears proved to be unsatisfactory since the noise of the gears was amplified to a rumble in the long elevator shafts of modern office buildings, hotels, and apartment houses. By changing over to the use of worm gearing, the condition was improved; but the amount of noise varied from installation to installation. These differences were attributed, in a large measure, to variations in the accuracy to which the gear sets were produced.

In its efforts to assure consistent accuracy. Westinghouse found that a major source of difficulty lay in the hobs used to cut the gears. Individual hobs not only produced gears giving varying results of quietness when new, but the results also differed between a gear machined by a hob when it was new, and a gear machined by the same hob after it was sharpened. The research program was, therefore, devoted to devising a basic cutting process and a hob design which would produce consistently identical and consistently quiet gears—both when the hobs were new and after they were sharpened.

The process finally adopted consisted of tangential feeding with both rough and finish cuts being taken by the same hob.

Developed cooperatively by Westinghouse and Michigan



Fig. 1—Michigan tapered hob used to cut bronze worm gears at Westinghouse Elevator.

Tool Co., Detroit, the hobs



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His name is listed in Union's THOMAS' REGISTER insert under the heading "Drills, Twist".

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were precision ground to Class A limits, or better. The roughing portion of the hob extended approximately 75 per cent of the length of the hob teeth; the finishing teeth comprised the balance of the 25 per cent of length. A series of hobs was standardized in the required range—3½ to 4¾ inch O.D. and 5 to 7 inches long.

In addition to producing the desired consistent accuracy, it was found that double the number of worm gears were cut by these hobs before it was neces-

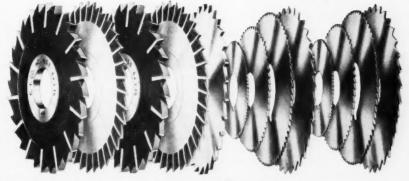


Fig. 2—Two sizes of bronze worm gears produced.

sary to regrind the hobs. Also, a comparatively smaller amount of material had to be removed in regrinding. The number of gears scrapped, the necessity of recutting gears to give a satisfactory tooth contact, and amount of runin time were reduced to a minimum.

Fig. 1 shows a Michigan tapered hob being used to cut a bronze worm gear at Westinghouse Elevator. Fig. 2 shows two of the various sizes of bronze worm gears produced. The various drives—some 131 varieties—call for gear set pitch diameters ranging from 18 to 42½ inch pitch diameter. Depending on the requirements, the gears may be cut with a single,

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double, triple, or quadruple lead. There are 31 different lead combinations ranging from a single lead having a .644 inch circular pitch to a quadruple lead with a 1.875 inch circular pitch.

Sundstrand Rigidmil for Milling Cylinder Heads

SHOWN in the accompanying illustration is an automatic transfertype Rigidmil which has been built by the Sundstrand Machine Tool Co. of Rockford, Illinois, for milling the top, bottom and two sides of cylinder heads. Seven stations are built into the machine—three milling stations, one turnover station, an idle station, a loading station, and an unloading station. All of the stations may be controlled from a master control button panel, or each may be controlled individually from the various station button control panels. The cylinder

heads are shuttled from station to station by means of the return movement of the milling heads, and thus a separate shuttling device is unnecessary.

After a cylinder head is located on the loading station, the cycle start button is pressed; and all subsequent movements are automatic. At the first milling station, the top and left side of the cylinder head are milled by means of a 25 h.p. traveling head having one vertical and one horizontal spindle. The piece is then turned 180 deg. at the turnover station, making bottom side up; and at the second milling station, the bottom of the cylinder head is milled by means of a 40 h.p. traveling head with one vertical spindle. The piece is then moved to an idle station, this station being necessary to allow room for movement of the two traveling heads on either side, and thence to the third milling station where the right side of the cylinder

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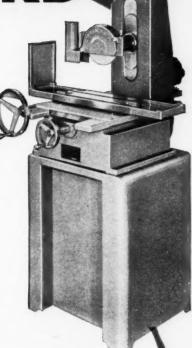
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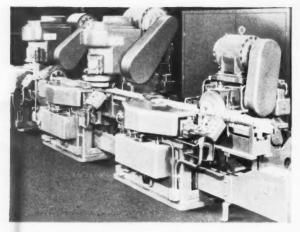
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Sundstrand automatic transfer-type Rigidmil designed for milling cylinder heads.

head is milled by means of a 15 h.p. traveling head with one horizontal spindle. The piece is finally moved to the unloading station and onto an outgoing conveyor. A safety switch is provided at this last station to prevent another cycle of operation from start-

ing before the finished cylinder head is removed.

Each of the milling heads has an automatic cycle of rapid approach, feed, and rapid return; and on each rapid return stroke, two workpieces are moved—the finished piece out ahead of the cutter, which

makes cutter relief unnecessary, and a rough piece into milling position. The timing of the heads is interconnected and established so that piling up at any one station is impossible. Chip removal is provided for by means of a motor driven chip conveyor.



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Next time your supplier calls ask him for a free copy of Star's booklet, "Metal Cutting", and the new Star Wall Chart. Both are packed full of valuable information on the selection, use and care of

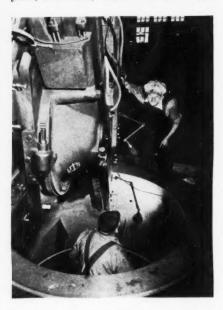


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blades, frames, metal cutting band saw
blades and the Clemson Lawn Machine.

Valve Body Machined with Cincinnati Boring Mill at Todd Shipyards

THE accompanying illustration shows an interior view of a 60 inch hollow jet valve body which is undergoing a contour machining operation at the Todd Pacific Shipyards Corp. yard, Alameda, California. The view



View showing interior of 10 ton jet valve body being machined.

shows the ram of a 10 foot Cincinnati boring mill operating off the profile with the tool bit machining the welded monel seat. The valve body is machined prior to the installation of needle support and other interior equipment.

The body casting, which weighs 10 tons and has an O.D. of 75 inches at the top and 102 inches at the bottom, is to be installed in the outlet works of the Enders Dam in Nebraska—an undertaking of the Bureau of Reclamation on the Missouri Basin Project.



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Fig. 1—LeMaire Special Machine and truck rear axle which is machined on it.

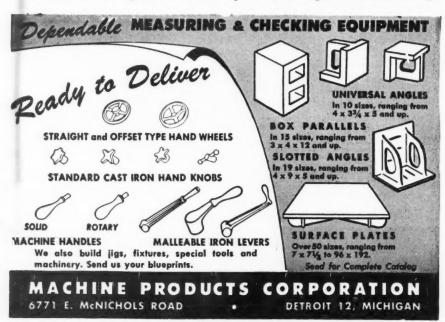
is used on an underslung or low clearance type delivery truck.

The machine, which was manufactured by the LeMaire Tool & Manufactur-

Truck Axles Machined with LeMaire Special Machine

THE accompanying illustration, Fig. 1, shows a LeMaire Special Two Way 42-Spindle Horizontal Machine which is being used by an axle manufacturer for machining the truck rear axle shown in the foreground. The axle

ing Co., Dearborn, Michigan, consists of a fabricated steel center base with two side bases, each of the latter supporting two Twin Ram Units. The center base is provided with a three-station shuttle-type fixture and a special rear drilling unit so that the following operations on the axle may be performed; rough and finish bore large





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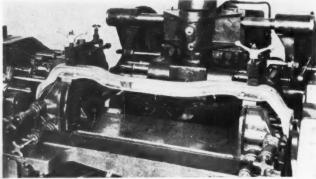


Fig. 2 - Close-up of the center section of the LeMaire Special Machine showing an axle in place.

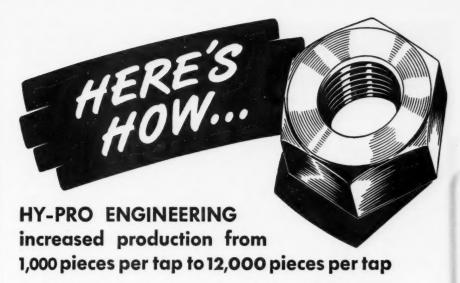
holes, face ends, drill and ream six bolt holes in each side from the outside. and spotface the bolt holes from the inside. A close-up view of the center section of the machine, with an axle in place, may be seen in Fig. 2.

At the first station of the machine. the axle is loaded; and then the left hand front and right hand front units

are activated to rough and finish bore the center holes and to face the ends using crossfeed tools. The axle is then shuttled to the second station. and the left hand

rear and right hand rear units are automatically operated to drill six holes in each bolt circle and to rough counterbore the center pilot holes. Following these operations, the left and right hand rear units are used again to ream the bolt holes and to finish counterbore the center pilot holes. The center rear unit is then





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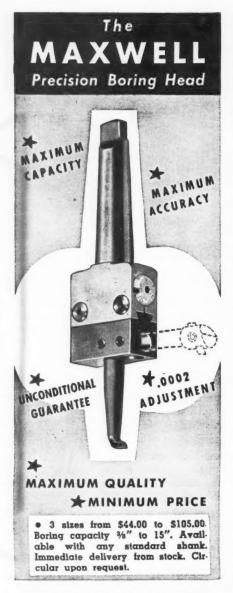
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started in order to spotface the bolt holes on each side from the inside.

The axles have a one deg. camber. and this factor necessitated a special workpiece, spindle, and tool arrangement to provide for the angularity. The axles are placed upside-down in the machine fixture so that the large dimension between the ends is at the bottom; the spindles of the left and right hand, front and rear units are mounted to account for the angularity; and the center rear unit is provided with a tilting mechanism so that it may be tilted to the left or to the right to spotface the bolt holes at an angle of one deg. up from the horizontal.

The boring and facing spindles at the front stations also have unusual features which are worthy of mention. By means of an auxiliary hydraulic cylinder, the pilot for each front boring tool is carried through the hole to be bored into a pilot bushing. As the feed of the unit progresses, the large hole is rough and finish bored. The feed is continued; and a special cross-facing tool, provided with three single point tools for rough, semi-finish, and finishing cuts, is brought into position to face the ends.

The electrical equipment on the machine is arranged so that, after an axle is positioned and clamped in place, the cycle button is pressed; and the work is carried automatically through the complete machining cycle. The rate of production is approximately ten axles per hour.

Worthington Mower Company Uses Airco No. 394 for Welding Mower Blades

THE recently introduced electrode, by the Worthington Mower Co. of Stroudsburg, Pa., for welding high carbon steel mower blades to mild



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AUTO ENGRAVER CO., Inc. 1776 Broadway New York 19, N. Y. steel discs. The accompanying illustration shows a typical welding operation being performed at the Worthington plant. The company, which was one of the pioneers in using a welded design for mowers, manufactures mowers for use on airfields, private estates, golf courses, parks, and other large expanses of grass and foliage-covered ground.

Airco No. 394 is a low hydrogen type electrode—one of the few of its



Airco No. 394 electrode being used to weld high carbon steel mower blades to mild steel discs.

type on the market—which operates on either AC or DC current. It produces welds exhibiting tensile strengths up to 100,000 psi. Rejects due to weld cracking have been reduced by approximately 50 to 60 per cent since the introduction of the new electrode; and, therefore, the amount of rewelding time required has also been reduced. In addition, a more rapid welding speed is being used which has resulted in an increase in mower production.

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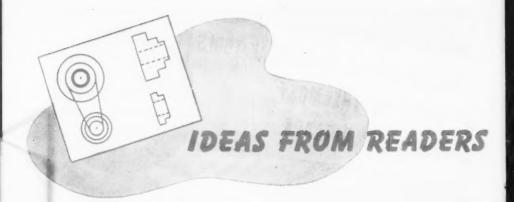




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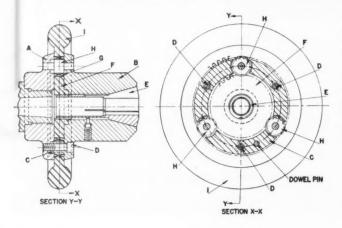
By CLIFFORD T. BOWER

THE geared collet chuck shown in the illustration was designed so that standard draw-in collets of a large size could be used on engine lathes not ordinarily equipped for their use. The use of such a chucκ allows bar stock of a diameter almost equal to the diameter of the spindle bore to be pushed through the hollow spindle of the lathe since there is no draw tube through the spindle to restrict the diameter. Another feature of the chuck is that the adjusting

mechanism is within easy reach of the machine operator.

As may be seen in the illustration, the chuck body is made in two sections, A and B. A circular projection, C, machined on B to fit into a circular groove machined in A, locates the two body sections properly; and they are fastened together by means of three setscrews, D, and a dowel pin. Part A is threaded for attachment to the lathe spindle, and part B is machined to accommodate the collet, E. The collet is opened and closed in B by means of a nut, F, which is screwed onto the threaded portion of the collet. Gear

teeth, G, are machined on the outer circumference of this nut to mesh with teeth on pinions, H. There are three of these pinions equally spaced around the nut, and they are activated by teeth



Sectional views of geared collet chuck.



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machined on the internal circumference of handwheel, I. Circular holes are cut in circular projection C, as may be seen, to provide space for the pinions to rotate. When the handwheel is turned by the operator, the pinions are rotated, the nut is rotated, and the collet is either opened or closed, depending upon the direction of rotation of the handwheel. Holes may be provided in the handwheel in which round bars may be inserted to obtain better leverage for turning.

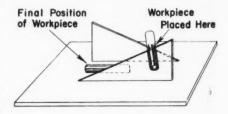
A stock gear was used for the nut F in the sample chuck shown in the illustration. Since the outside diameter of the chuck body is dependent upon the size of the nut, the body diameter may be reduced by using a smaller diameter nut. Also, by using a large diameter handwheel with respect to the nut, it is possible to make adjustments with fewer rotations of the handwheel. The chuck illustrated worked well on a light 16 inch lathe and greatly increased its usefulness.

Method of Reversing Hot Workpieces

By B. A. LEE

IN THE idea article entitled Bolt Blank Positioner which appeared in the April, 1949 edition of MODERN MA-CHINE SHOP, the authors, Carlin and Roundtree, described a method of reversing bolt blanks which is used in the L & N shop. An alternate method of performing this job, which the author feels is simpler, is suggested here.

As may be seen in the accompanying sketch, a simple device is made to be used for the work. It consists merely of two triangular plates which are welded to a larger flat plate. The three



Sketch of a simple device for turning hot workpieces.

parts are arranged as shown. By making the device in three different sizes, a wide range of work may be accommodated; the distance between the triangular uprights is less than the length of the work. All of the components may be made from scrap stock, and no machine work is necessary other than the operation of shearing the parts to size and shape.

In operation, a piece of stock, which has been heated on one end, is placed across the triangular uprights and then released. One end of the stock will roll down the long side of the tri-

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angular upright on which it has been placed, and the other end will roll down the other long side. This action turns the stock and causes it to drop down onto the plate between the uprights. The workpiece may be turned as much as 110 degrees.

Bending Device for Small Parts

By R. H. DAUTERICH

A N order to fabricate several thousand parts like the one shown in Fig. 1 prompted the design of the bending device shown in Fig. 2. The parts were made of 1/16 inch plate, and it was necessary that the 90 deg. bend be accurate. The parts were blanked out flat, and the holes were drilled and tapped prior to the bending operation.

The bending device was used under

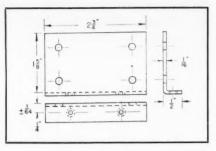


Fig. 1—Small part which required an accurate 90 deg. bend.

the ram of a punch press. The work was inserted in the space A, between the bottom plate, B, and the positioning plate, C, against a stop which is not shown. The top portion of the device, consisting of a block, D, and a bending plate, E, was then pushed downward by the force of the punch press ram. At this downward motion,



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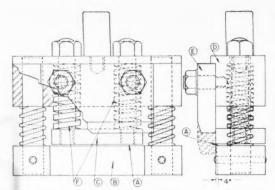


Fig. 2—Bending device designed to produce 90 deg. bend.

was forced by the bending plate over the sharp edge machined in the bottom plate to produce the required 90 deg. angle bend in the work. As may be seen, the sharp edge in the bottom plate was machined to an angle of four degrees to assure this proper angle of bend.

spring coils, **F**, made of 3/16 inch square wire, were pressed against the positioning plate to hold the work firmly between **C** and **B**.

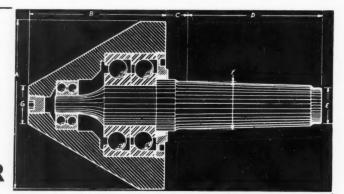
The device was so designed that the work was positioned definitely before the bending plate reached the point of bend. Upon further downward motion, the protruding portion of the work

Uses for Old Files

By A. H. WAYCHOFF

TWO uses for old files are described herewith. First, an old flat file that has been used until the filing surfaces have been almost completely worn away may still be used for filing

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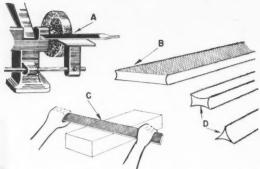
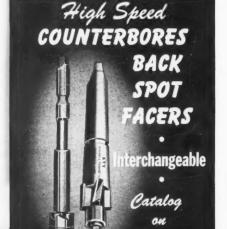


Fig. 1-An old file, after alteration, may be used again for filing.

if certain alterations are made. The sides of the file are ground concave by setting the guide of an emery grinder as close to the wheel as possible, positioning the file flat on the guide, and drawing the file horizontally to the left and to the right across the wheel. The grinding operation produces rows of tiny sharp teeth along the edges of the file. The grinding set-up may be seen at A in Fig. 1; the concave surfaces and the teeth are shown at B. The file may then be used for filing flat surfaces, the file being held so that only a toothed corner contacts the work; the file is drawn toward the operator

and at a 45 deg. angle to the work, as shown at C. Using this type of file. metal may be removed quickly from flat surfaces. Three cornered and square files may be treated similarly. as may be seen at D.

Second, an old file may be made into a cut-off tool for a metal working lathe, as shown in Fig. 2. The tang of the file is cut off, as shown at E, and the thickest side of the file is ground, as at F. The file is then sharpened as for any cut-off tool, and it may then be used in a regular tool holder, G.



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Fig. 2-An old file may be made into a cut-off tool.

Thus, instead of throwing away an old file, the life of the file is increased. and the file can be made useful.

Versatile Indicator Holder

By JOHN C. MOTTL, JR.

THE accompanying illustration shows a versatile indicator holder which has proved to be especially use-

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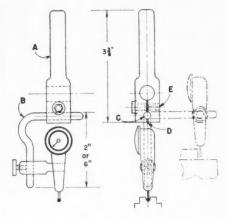
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ful. The holder is made in two parts, a holder body, A, and an indicator arm, B. The body, A, is made from \% inch diameter drill rod, and it is 3% inches long. A 3 inch diameter hole, C, is drilled and reamed at one end; and a saw slot, D, is cut along the axis of the part. A hole, E, is drilled and tapped perpendicular to the slot to accommodate an 8-32 socket head cap



Parts of a versatile indicator holder drawn in position with an indicator attachment.

screw. The indicator arm, B, is made from 3 inch drill rod, and it is made in a modified L-shape; it may either be two or six inches long, depending on the size of the work to be measured.

When using the holder, the indicator arm is placed in the hole provided in the body, as shown, and the cap screw is tightened down. The indicator attachment is then slipped over the free end of the arm, and the attaching screw is tightened. The indicator arm may be turned in hole C to adjust to various sizes of work, as is indicated by the phantom lines in the above illustration.

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Above: Motor-powered Type E . . . bends fixed radii of 6 to 1 up to 90°. Type E bends 2½", 3", 3½" and 4" pipe. 3 horse-power motor. Floor space occupied—7 6" x" 7" 6". Other power machines up to 8" capacity.

"

Mericun

PIPE SENDING MACHINE

Company-INC.

News of the Industry

The Resistance Welding Institute

Establishment of The Resistance Welding Institute, an educational organization for the dissemination of information on technical advances in resistance welding, has been announced. Lee H. Judge, industrial public relations executive, will serve as director of the institute with headquarters in Cleveland, Ohio.

Sponsored by a number of companies interested in resistance welding, the institute was created to make available to industry up-to-the-minute facts on spot, seam, flash, and projection welding.

American Drill Bushing Opens New Plant

American Drill Bushing Co., Inc., Los Angeles 21, Calif., has opened a new modern office headquarters and manufacturing plant at 1608 Essex Street. The plant, occupying a large area, provides ample parking space, as well as additional room for more modern equipment and increased production facilities. Storage space is provided for maintaining complete stocks of bushings.

Equipment employed in the new plant includes internal grinders, cylindrical grinders, automatic screw machines, turret lathes, precision hones, and lapping machines. The engineering department is completely staffed to handle drill bushing problems that might occur.

N.M.T.B.A. Summer Sales Conferences

Four summer sales conferences designed expressly as refresher courses in sales engineering for the machine tool industry are announced by L. D. McDonald, president of the National Machine Tool Builders' Association, in cooperation with Cornell University, Western Reserve University, Dartmouth College, and Purdue University. Each conference will last 5½ days beginning on Monday morning and ending Saturday noon. The dates are as follows: July 11 to 16 (Cornell University, Ithaca, N. Y.); July 25 to 30 (Western Reserve University, Cleveland, Ohio); August 8 to 13 (Dartmouth College, Hanover, N. H.); and August 15 to 20 (Purdue University, Lafayette, Ind.).

The conferences are open only to sales managers, district managers, and salesmen who are employees of members of the National Machine Tool Builders' Association or the American Machine Tool Distributors' Association. The curriculum will be based on the lectures, problems and discussions presented during the course at Cornell in July 1948 and on a textbook now being published by Professor Harry J. Loberg who is in charge of the conferences and is head of the Industrial and Administrative Engineering Department of the College of Engineering at Cornell. A faculty of resident professors will be selected at each of the host universities, cooperating with members of the industry under the general direction of Professor Loberg.



New Plant of American Drill Bushing Company, Incorporated

Monarch Precision SHAPLANE Radius Tools



Five Models for

LATHES, SHAPERS, PLANERS, AND BORING MILLS.

RANGE 1/2" TO 3" RADIUS (MODELS ALSO AVAILABLE FOR CONVEX CUTTING, AND CONCAVE RADII TO 6" ON PLANERS, ETC.)

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For a true fit every time, rely on Brighton Socket Screws. Threads are precision-formed . . . meet all standards of accuracy. Sockets are uniform . . . fit hand-in-glove with your wrench. B-Right-On Socket Set Screws set tight . . . stay tight.

First-quality materials . . . the most modern production methods . . . critical inspection make all Brighton Socket Screws tip-top. Send for revised price and size list.

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New Eutectic Welding Alloys Corporation Plant No. 2, Flushing, New York

New Large Electrode Plant Opened by Eutectic

Rene D. Wasserman, president and founder of the Eutectic Welding Alloys Corporation, manufacturer of low heat welding alloys, announced that "Cut-Trode," Eutectic's cutting electrode, was used to cut apart a steel ribbon in opening ceremonies of the company's recently acquired Flushing plant. The new plant occupies approximately 100,000 square feet and houses a foundry, metal rolling and drawing plant, and several large extrusion presses for producing coated elec-

trodes, as well as alloy cutting facilities. It will also contain a complete gas welding division plus special control and research laboratories.

Thompson Grinder Holds Open House

At an open house attended by several thousand persons, including visiting manufacturers, newspaper men and editors, The Thompson Grinder Co., Springfield, Ohio, formally announced two new



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Broken Tool REMOVER



Only \$95

• It's sensational — Every shop, every tool crib should have one. Removes broken tools and studs by electrical disintegration from a part being machined without damaging the part. Saves castings otherwise scrapped. Set it up on your drill press.

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Quality

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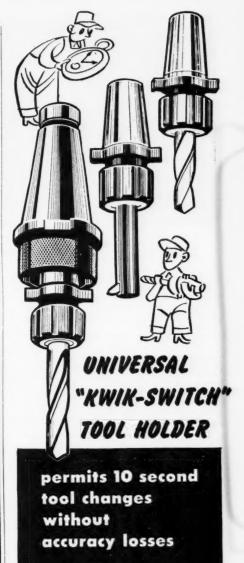
Consult SEIBERT engineers before retooling or replacement.

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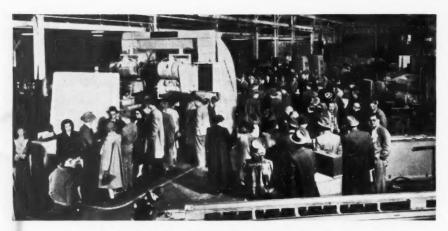
Seibert & Sons, Inc. East Peoria 8, III.



FRANKENMUTH 9, MICH.

ENGINEERING CO.

UNIVERSAL



View of the Large Crowd which Attended the Recent Open House Held by Thompson Grinder Company

and completely different machine tools; namely, the Thompson "'Hydrall' Surface Grinder and the Thompson "Truformatic" Contour Grinder. At the same time, Christian Baldenhofer, president, honored all employees having over 20 years of service with the company.

Persons in attendance were impressed by the massiveness of the Hydrail machine and its ability to accommodate huge railroad wheel housings with wheels mounted. The machine weighs over 130,-000 lb, and is destined for England. Other Hydrail machines are in production for aircraft companies.

Equally amazing was the production rate of 4,000 parts per hour on the new Thompson Truformatic Contour Grinder which is totally enclosed and is designed to crush and grind gangs of automobile lock bearing surfaces automatically.

George Gorton Awards Engineering Scholarship

The Scholarship Committee for the George Gorton Scholarship in Mechanical Engineering has announced that David A. Dixon, 442 Wolff St., Racine, Wis., was the successful applicant for this "big brother" scholarship. Established in the fall of 1948, the George Gorton Scholarship is designed to provide an opportunity for worthy and competent young men to pursue a college engineering program and to assure a supply of competent mechanical engineers.

Mr. Dixon has selected the University of Illinois as the school of his choice. This is one of the five universities which has agreed to cooperate with the Scholarship Committee and admit for registration the winner regardless of the waiting list.



Rod Grinding

STRAIGHT RODS

1/32" to 1/2" Diameter Diam. Tol. .0005" on Rods Up to 6' Long. Diam. Tol. .001" on Rods Up to 12' Long.

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Long Life.
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Economy's CLOSE-TOLERANCE DRILL-JIG BUSHINGS AND GAGES MEET YOUR HIGHEST STANDARDS

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When you need cap screws, set screws, milled studs or coupling bolts of any machineable material and with any thread, remember . . . WHO makes them better.

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WHO is ... Wm. H. Ottemiller

Write for name of nearest distributor and our free illustrated folder.

Wire Association Elects Officers

At the annual directors meeting of The Wire Association held recently at the Biltmore Hotel, the following officers were elected for the ensuing year: President, L. D. Seymour, manufacturing manager, Wire Mills Div., John A. Roebling's Sons Co., Roebling, N. J.; vice presidents, F. M. Crapo, president, Indiana Steel & Wire Co., Muncle, Ind., and R. B. Roth, vice president and purchasing agent, Ludlow Saylor Wire Co., St. Louis, Mo.; secretary-treasurer, R. E. Brown, editor and publisher, "Wire and Wire Products," Stamford, Connecticut.

To Award Prizes for Outstanding Article on Carbides

The Society of Carbide Engineers has announced that it will award a prize of \$50.00 to the person submitting the most outstanding article pertaining to the use of cemented tungsten carbides. The contest is open to everyone excepting the executive committee of the society and the contest judges. A certificate will be presented along with the \$50.00 prize to the author of the winning article.

All entries must be in the hands of the society not later than October 15, 1949. The winner will be announced on December 8, 1949. All inquiries and articles should be mailed to The Society of Carbide Engineers, P. O. Box 141, West Hartford, Connecticut.

Eben J. Fullam

Eben J. Fullam, chairman of the board of directors of The Fellows Gear Co., Springfield, Vt., died recently at his winter home in Mount Dora, Florida, at the age of 78. Mr. Fullam became associated with Fellows on February 7, 1898. He was elected treasurer on January 12, 1899, and held this office until he assumed the vice presidency on January 1, 1939. Since his election as a director on January 25, 1916, he served continuously in that capacity. He became continuously in that capacity. Company on September 3, 1945 and on November 6, 1948, retired as president and was elected chairman of the board.

From 1931 to 1935, Mr. Fullam was also president of the Bryant Chucking Grinder Company. He was a former president of the First National Bank of Springfield, Vermont, and at one time served as a director of the National Machine Tool Builders' Association. During the past few years he had been a director of Vermont Foundries.

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Co., Inc.
200 Edwards Street

ST. LOUIS 8, MO. Blackman & Nuetzel Machy. Co. 3713 Washington Blvd.

SYRACUSE 2, N. Y. Briggs, C. H. Mach. Tool Co. Inc. Onondaga Hotel Bidg.

W. HARTFORD 7, CT. Rudel Machinery Co., Inc. 7 South Main St.

ABRASIVE ACCURACY DOSTS PRODUCTION

Did You Know?---

Lovejoy Tool Co., Inc., Springfield, Vt., has appointed the A. J. Rod Co., 924 M & N Bldg., Houston, Tex., as exclusive representative in southern Texas for the Lovejoy line of milling cutters and other inserted-tooth type tools.

The Lincoln Electric Co., Cleveland 1, Ohio, has announced the election of the following three additional members to its board of directors: G. F. Clipsham, assistant to the president: William Irrgang, director of plant engineering; and L. K. Stringham, director of welding develop-

The H. C. Hook Co., Inc., 340 Main St., Worcester, Mass., has been appointed to represent The Whiton Machine Company exclusively in the sale of lathe chucks, gear cutters, centering machines, and special purpose high production milling machines in the states of Massachusetts, Rhode Island, Vermont, New Hampshire, and Maine. The Vandyck Churchill Co., 42 Church St., New Haven, Conn., has been appointed to handle the sale of the same equipment for The Whiton Machine Company in the State of Connecticut.

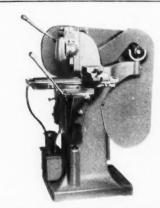
At a recent meeting or the stockholders of the E. Horton & Son Co., Windsor Locks, Conn., the following directors were elected: Donald B. Huntting, Douglas H. Thomson, Paul W. Adams, H. Bissell Carey, Jr., Mary A. Caffrey, L. Mc-Gregor Demarest, Spencer Montgomery, and Sidney E. Horton. Immediately following the meeting, the directors elected the following officers: Donald B. Hunt-ting, president; Douglas H. Thomson, vice president and treasurer; Mary A. Caffrey, secretary.

A modern new stainless steel wire mill at American Steel & Wire Company's Waukegan, Illinois works will be opened officially during ceremonies June 23.

Wm. K. Stamets Co., Rockefeller Bldg., Cleveland 13, Ohio, has been appointed dealer in the Cleveland territory by The Sidney Machine Tool Co., Sidney, Ohio, for the sale of engine and toolroom lathes.

The Tamms Silica Company, with general offices at 228 N. LaSalle St., Chicago, has opened an office and warehouse at 1900 Alfred St., Detroit, Mich. Harold J. Doty, sales representative of the company for many years, is in charge.





U. S. No. 1 MILLING MACHINE

has proved itself the number one value in medium size. all purpose hand milling machines. New universal attachment doubles its scope. Send for information.

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TROYKE ROTARY TABLES

WORM WHEEL OPERATED ROTARY TABLES



BALL BEARING STATION INDEXING TABLES . . .



12", 15", 18"

See your dealer or write for Catalog 14.

TROYKE MFG. CO. Cincinnati 9, Ohio, U. S. A.



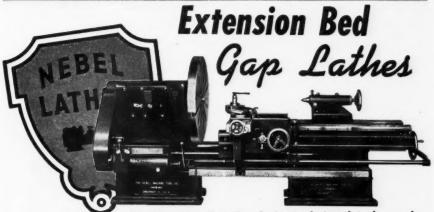
"OLIVER" 30-inch Metal Cutting BAND SAW

Has low speed geared head direct connected to lower wheel for cutring heavy sections of metals. Also furnished with high speed motor for sawing compositions, woods and sheet metals.

Powerful!
Cuts true
and steady.
Quick-change
rim and tire.
Automatic
brakes.



Oliver Machinery Co., Grand Rapids 2, Mich.



Illustrated is the Series "AG" 20/40" Extension Bed Gap Lathe. Also made in 28/50" Heavy Duty. The Extension Bed Gap Lathe is designed to be used either as a gap lathe or an engine lathe.

We also manufacture a line of regular geared head engine lathes.

Write for circulars.

The Nebel Madre Tool Co.

Did You Know?---

The Detroit Die Set Corp., Detroit 2, Mich., has appointed the following new sales representatives in the New England and New York areas: Nelson R. Church who will direct sales in Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine; E. M. Benson who will cover Connecticut; and C. W. Keeny of Benson and Church Co., 1060 Broad St., Newark, who will supervise sales in New York City, Long Island, Manhattan, and nothern New Jersey.

Standard Tool Co., Cleveland, Ohio, (drills, reamers, milling cutters, taps, dies, special cutting tools), has appointed Alan Carver manager of its New York City branch office.

Chicago-Latrobe, Chicago 10, Ill., has opened a new factory branch at 111 E. Milwaukee St., Detroit, Mich., where a complete inventory of twist drills, reamers, countersinks, counterbores, and carbide-tipped tools will be carried. Factory district representatives operating from this branch include Joseph A. Wolfe and William B. Crump, the latter having recently been appointed district manager in the Michigan industrial territory.

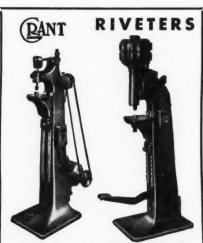
GRANDON WIS SOSTA

The B. C. Ames Co., Waltham, Mass., has appointed The W. E. Fry & Co., 909 Wyandotte St., Kansas City 6, Mo., as exclusive representative for its line of micrometer dial gages and micrometer dial indicators in the states of Kansas, Nebraska, and Missouri.

Atlantic Gear Works, Inc., 198-A Lafayette St., New York 12, N. Y., has been appointed exclusive distributor in the states of New York Connecticut, and New Jesey, south to and including the city of Trenton, for the stock gears manufactured by the Ohio Gear Co., Cleveland, Ohio.

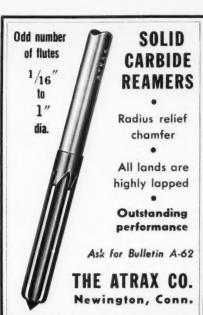
The Denison Engineering Co., Columbus 16, Ohio, has appointed The Henry Walke Co., 1310 S. Tryon St., Charlotte, N. C., as representative in North and South Carolina for the Denison Multipress line of oil-hydraulic presses and accessories.

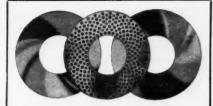
To afford ample space for handling stocks of collets and feed fingers and for having precision machines on exhibit, **Hardinge Bros.**, **Inc.**, Elmira, N. Y., has moved its Rochester office to larger quarters at 491 Main St., E., Rochester 4, New York.



 Pioneers in the riveting field. Head rivets from smallest to %" diameter, either by noiseless spinning or vibrating harmer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles. Write for literature—and don't forget to send samples.

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THE GRANT MFG. & MACHINE CO.
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FLAT RACE BALL THRUST BEARINGS WITH BRONZE RETAINERS

These bearings range from ½" to 3½" shaft diameter; from 1-7/32" to 5-7/32" outside diameter. Larger sizes can be made to 25" outside diameter.

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The Quick, Easy, Handy Way to TAP BY HAND

. . Adapts for LATHE USE

THE DAHLSTROM TAP GUIDE virtually eliminates tap breakage—and saves those costly hours spent prying broken taps out of dies. Saves time, too. Just a few turns of the handle and the job is done.

Winds through continuously, with no backoff. Work is always dependably straight and square. Fasten it to a post or set it on top of a big job. This handy tapper comes equipped with 7 adaptors, 8-32 to ½" but taps are not furnished. Spindle can be pulled out and used in a lathe, or used as tap extension for hard-to-get-at-places. 33" x 8" x 14", wt. 32 lbs. DAHLSTROM MFG. CO., 2522 WEST LARPENTEUR AVE., ST. PAUL 8, MINN. Send for Free Circular.



Also Makers of Dahlstrom Autostop and Tap Chuck

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FIVE TONS of smooth power is at your service with this compact and versatile tool.

The perfect press for garage, electric motor shop, refrigerator repair and machine shop.

Will operate lying horizon-

Ram has removable anvil and retracts itself when released. Weight 100 lbs. Stroke 5½". Height 53". Width inside 16".



ARTHUR J. HURT & CO.

360 South Navajo Street Denver 9, Colorado

UNIVERSAL CARBIDE GRINDER

with the Patented



GRINDS WET ...

It has a pump that supplies coolant in liberal quantity to prevent overheating while rapidly removing stock. Carbide tip won't crack while grinding!



QUEENS VILLAGE 9 NEW YORK
Mfrs. of Hager Measuring Microscopes

Did You Know?---

The Standard Furnace Division, Surface Combustion Corp., Toledo 1, Ohio, has appointed Berton M. Sharpe as sales engineer to cover the territory of southern Indiana. southwestern Ohio, and northern Kentucky.

The Continental Screw Co., New Bedford, Mass., has appointed Victor Ladetto as sales manager and Donald H. Sleeper as assistant sales manager.

J. H. Tredinnick has been named vice president of the E. W. Bliss Company. Mr. Tredinnick was formerly manager of Bliss' Hastings. Michigan plant which specializes in the manufacture of small and medium size punch presses and high production presses.

Scully-Jones & Co., Chicago 8, Ill., has appointed the G. C. Wood Co., 814 Clark Bldg., Pittsburgh, Pa., as its exclusive representative in the Pittsburgh area.

Hugo W. Jones, for the past 10 years with Tungsten Electric Corporation, has joined the Adamas Carbide Corp., Harrison, N. J. (tungsten carbide tool tips, dies, wear parts) as assistant sales manager.

Jack W. Crawford, formerly with the Firestone Tire & Rubber Company, has been appointed manager of the newly created Distributor Sales Division of Firth Sterling Steel & Carbide Corp., Mc-Keesport, Pennsylvania.

Monarch "Mona-Matic," an air-gage tracer controlled automatic cycle production machine for single-point metal turning, is fully illustrated and described in a 32-page booklet published by the Monarch Machine Tool Co., Sidney, Ohio. The booklet fully covers the operation, design, features, optional features, specifications, and so on, of the various available models. Copy of Booklet No. 1804 is available free to mechanical executives upon request.

Material Handling Equipment. A catalog now being distributed by Equipment Mfg. Inc., Detroit 5, Mich., illustrates and describes a line of stacking type material handling equipment, including portable stock racks, pallet racks, coil stock racks, and collapsible boxes for a wide variety of industrial uses. Copy free upon request.



THE SAMSON AUTOMATIC CLUTCH PULLEY
A clutch while starting
A pulley when driving

Fully reversible; compact; adaptable to single or multiple vee belt drives.

An efficient variable - width sheave operated by centrifugal force. Engagement speeds are pre-set to your specifications within limits of 750 to 3500 R.P.M.

For further information

THE SAMSON MANUFACTURING CO.
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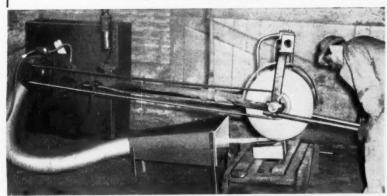
SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-incb capacity, \$145; 3-incb capacity, \$295; 1-incb capacity, \$95

Round, square or hex collets, plain—serrated
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STOP DUSTS

Model 1150 (below) is only one of a complete line (250 to 3600 cfm)



AGET-DETROIT CO. 207 Main at Washington ANN ARBOR, MICH. Phone 2-5585 for Rush Shipment From Stock WITH

DUSTKOP



Surface Grinder

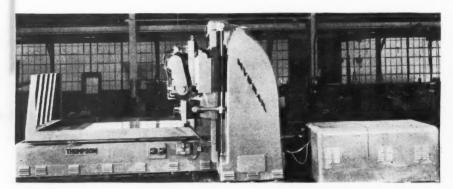
The Thompson Grinder Co., Springfield, Ohio, has announced the development of a surface grinding machine, known as the "Hydrail," which is especially designed to handle large workpieces from rough to finish up to 48 inches both vertically and horizontally with maximum table length of 240 inches. The model shown in the accompanying illustration is 72 x 36 x 120 inches. Other sizes and capacities are available.

The wheel head or heads are mounted on a massive bridge for rigidity and are designed to grind either horizontally or vertically, depending upon the application. The wheel heads are individually belt driven from 30 h.p. motors operating at a speed of 120 r.p.m. The machine may be equipped with either two horizontal heads or one horizontal and one vertical head.

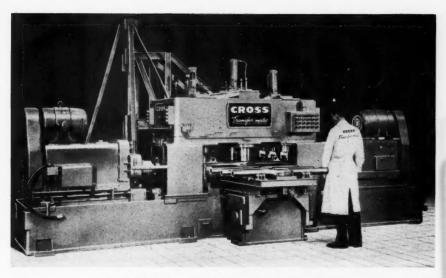
A dual set of push-button controls enables the operator to control all operations from either side of the machine. Or, since the two wheel heads may be operated independently, two operators may work on two separate jobs at the same time. All cycles of operation are completely automatic, although manual control is also provided. The table speed is variable from 0 to 100 feet per minute.

The entire hydraulic power unit is enclosed in a tank shown at the right of the main vertical column in the illustration. The coolant pump is located on the opposite side of the machine from the hydraulic pump tank.

To facilitate dressing the wheels, a flow control valve is provided for controlling the travel of the wheel sideways at a rate of from 5 to 50 inches per minute. Both the horizontal ways and the vertical columns are totally enclosed in bellows type covers.



Thompson "Hydrail" Surface Grinder



Cross "Transfer-matic" for Boring and Facing Axles

Axle Boring and Facing Machine

A special machine tool which is designed to bore and face three types of automotive axle housings without changing the setup has been announced by the Cross Co., 3250 Bellevue Ave., Detroit, Mich. At 100 per cent efficiency, 280 parts are said to be processed hourly by only

one unskilled operator.

The machine is a three-station transfer type unit or "Transfer-matic" as Cross designates its machine tools equipped with material handling devices to automatically move parts from one operation to the next. Three types of axles are brought to the machine in two different lengths. At the first station, any three of these are loaded. At station two, both ends of each axle are bored and faced, with the machine automatically adjusting for length through an electric eye setup. At station three, the parts are automatically sorted by type and placed onto either one of two conveyors, depending upon subsequent processing requirements. One conveyor which travels at right angles to the machine receives all axles with insulator brackets attached. either long or short; the second conveyor, a continuation of the flow of work through the machine, receives all other axles.

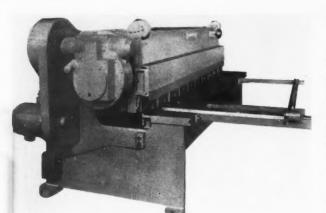
Since the Transfer-matic is made up of standard Cross sub-assemblies, flexi-

bility for part design changes is provided. Other features include hydraulic feeds, hardened and ground steel ways, and automatic push-button controlled working cycle.

Columbia Steel Squaring Shear

A steel squaring shear announced by the Columbia Machinery and Engineering Corp., Hamilton, Ohio, incorporates design features to promote efficiency and economy of operation. Speed and accuracy of gauge setting as well as of actual shearing are said to be provided and ease of operation is effected by such features as a motor-operated precision back gauge, solenoid-operated clutch controlled by a movable foot switch, and low overall height. Super-rigid welded rolled-steel construction affords maximum strength with minimum weight.

A standard feature of the Columbia Steel Squaring Shear is a quiet-operating and vibration-free worm-gear drive. The shaft and worm are machined in one piece from high-alloy chrome-nickel steel, and the worm gear is of special aluminum bronze with a tensile strength of 60,000 p.s.i. A high-carbon alloy-steel clutch with six jaws is bolted to the web of the worm gear, the clutch operating on the large squared end of the eccentric



Columbia Steel Squaring

shaft to ensure a positive, rigid driving connection. The clutch is actuated by an electric solenoid, thus permitting operation by means of a convenient portable foot switch, and the drive and clutch operate in an oiltight dustproof housing of ample size to assure rapid heat dissipation and prevent oil churning losses.

Automatic hydraulic hold-downs, controlled by a cam to ensure positive operation, grip the work firmly before the blade begins to cut. The hold-downs consist of a series of independently-operated plungers, actuated by oil pressure. Since the same pressure is exerted by each plunger, regardless of travel, a uniform grip is applied throughout the entire length of long pieces, effectively preventing slippage, even when narrow strips are sheared, it is claimed.

A labor-saving feature of the machine is the motorized back gauge, which is operated by an individual electric motor and controlled by a push-button switch readily accessible to the operator. Adjustment is made through a simplified chain and sprocket drive and screw mechanism which is self-locking. A vernier dial indicates the exact setting so that an operator with little experience can easily set the back gauge within 1/128 inch.

The eccentric shaft is of heat-treated high-carbon steel with eccentric forged integrally. Blades of special-analysis shear-blade steel are standard equipment. Special blades with unusually long service life are available on order. Other features of the shear include front adjustment of the slide or upper blade holder; long, uninterrupted slideways; stainless steel scales; centralized oneshot lubricating system; and carefully-designed safety features, including a unique finger guard which is located in front of the holddowns but permits feeding of narrow pieces without any difficulty.

The Columbia Steel Squaring Shear is available in seven sizes for shearing % to 11/4-inch mild steel in 6 and 10-foot lengths. Three additional models for the

high-speed precision shearing of 18-inch mild steel, 10 to 12 feet long, and 1/4 inch x 6-foot mild steel incorporate all important design features of other models except the motor-driven back gauge and hydraulic hold-downs. All models can be furnished with a special shear motor with switch starter and enclosed V-belt drive, and can be factory-equipped with specially-designed accessories for more efficient operation, including a micrometer back gauge with 24 or 36-inch range, adjustable in sixty-fourths of an inch; 10-foot range squaring arm with steel scale and adjustable folding gauge finger; front gauge with 50-inch range; and speciallydesigned light gauge for scribe-line shearing.

Planetary Hyper-Production Thread Roller

The Batchelder Engineering Co., 10 Park St., Springfield, Vt., announces the development of the Beco Model 312 Planetary Hyper-Production Thread Roller illustrated herewith which is claimed to provide a production rate of 750 headed machine or cap screws per minute at normal hardness or 375 per minute preheat treated.

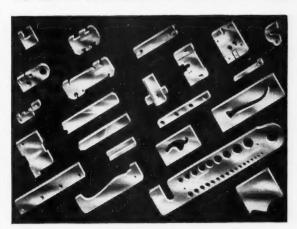
The machine utilizes one externally threaded continuously rotating cylindrical inner die and three internally threaded stationary external segment dies. Three independent automatic feeds deliver blanks to each of the outer dies. Blanks having three different types of

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STARRETT Precision Ground Flat Stock is high grade annealed tool steel cut lengthwise from the sheet and ground to within .001" in thickness, 18-inch lengths, widths from ¾" to 10", thicknesses from 1/64" to 1¾". Each piece individually wrapped and marked with size, type and heating instructions.



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A non-deforming, electric furnace tool steel, fully spherodized annealed with fine grain structure and deep hardening characteristics. Ideal for precision parts which require accuracy of size after hardening.

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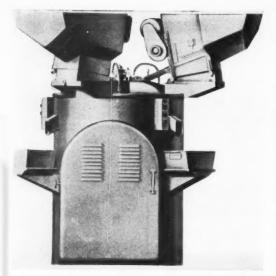
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Beco Model 312 Planetary Hyper-Production Thread Roller

heads can be rolled simultaneously, if desired, the blanks dropping into separate work baskets to prevent mixing. Three starter fingers introduce the three blanks to the starting ends of the outer dies. Then, when the screws have rolled in a planetary manner about half the length of the outer dies, three succeeding blanks are introduced. When the first set of screws reaches the leave-off ends of the outer dies, a third set of blanks is started. Thus, six screws are always being rolled at any given instant. When rolling preheat-treated stock, a single lobe cam is substituted for the normal double lobe cam, and blanks are started just half as often.

Setting up of the machine has been made as simple as possible. The outer dies are identical: therefore, when setting up, matching the inner die with one outer die automatically takes care of the other two dies. Since the threads are always centered lengthwise and crosswise in the outer dies, one, two, or all three dies can be turned over without keeping them in sets. One or two dies can be replaced if accidentally damaged without replacing the entire set. Any inner die with correct pitch and lead can be used with any outer die of corresponding characteristics without sacrificing the settingup time.

Each feed is provided with a separate ¼ h.p. motor and

starter. Slip clutches are provided in case of jams which, if occur, can be quickly cleared through access doors. A 30 h.p. main motor drives the spindle through a Gilmer timing belt. The lubrication system is entirely independent of the coolant system and the transmission is protected from the entrance of coolant or chips.

Entirely mechanical in operation except for the electrical equipment, the Beco Model 312 Thread Roller is completely wired to the main motor controller and requires only a single connection for installation. Specifications of the machine are as follows: work range, No. 4-48 to and including %-inch 18-thread headed machine or cap screws; maximum shank length, 3 inches; maximum thread length, 3 inches; accuracy, Class 3

Pictured: a 24-Spindle Heavy-

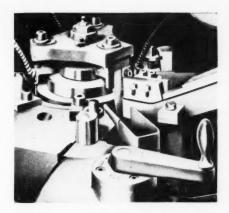
DESIGNERS AND MANUFACTURERS OF MULTIPLE DRILL-ING EQUIPMENT.

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MICHIGAN DRILL HEAD CO.

HEAD CO. 971 E. 8-Mile Road, Hazel Park, Mich.



Close-Up View of Beco Model 312 Thread Roller, Showing Threading Dies, Feeding Arrangement and Other Operating Mechanism

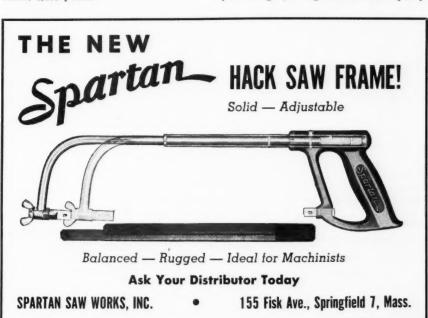
threads; diameter overall, 77½ inches; base, 42 x 35 inches; distance which top of the feed hopper is located from the floor, 66 inches; and weight of the machine, 3.800 pounds.

Sheet Metal Drawing Press

Product of The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, the H-P-M Fastraverse Sheet Metal Drawing Press illustrated herewith has a 1000/500-ton pressure capacity and is designed to handle deep draw jobs of unusually large dimension. The machine has a platen of 120 x 72 x 70-inch daylight opening and 36-inch ram travel, and is equipped with a 300-ton H-P-M hydraulic die cushion with a platen of 48 x 52 inches and a 24-inch stroke. The bolster plate is removable.

The press is provided with three main rams for the multiple press ram system of operation in two ranges of pressing speed. For a fast preliminary pressing at medium pressure, either the central main ram or the two outer rams can be employed with a 500-ton pressure. At a predetermined position, all three rams can be used to develop the high pressure required for final forming.

The press is equipped with the H-P-M Closed Circuit Fastraverse system of operation, which regulates both the speed and direction of every press ram movement through control of the output of the pressure generating H-P-M radial pump.





Save Up To 85% of Weld Cleaning Labor—Unretouched photo shows how quick weld spatter "comes clean" when you paint or spray Protect-O-Metal No. 2 before welding. No profit-wasting work with air chisels, wire brushing, or sand blasting. Get smooth, clean surfaces. Unlike all other "spatter-proofing" compounds, Protect-O-Metal No. 2 will not cause smoke, fumes or odors. One coat serves all needs, costs about 1/10¢ per foot of weld, saves up to three times its cost in time savings alone. Order a Trial Gallon (\$3.15) for testing. Your money back if compound does not prove entirely satisfactory.

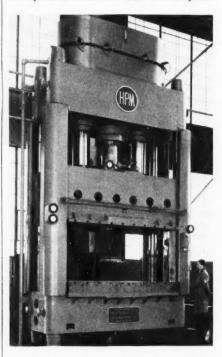
PROTECT-O-METAL No. 2

G. W. Smith & Sons, Inc. 5407 Kemp Road, Dayton 2, Ohio

OK. Send me a trial gallon. I understand you will cancel the invoice if I'm not entirely satisfied.

Ivame		
Firm		
4.1.1		

The Fastraverse action results in fast travel of the ram to the work, a slower, controlled, smooth pressing speed, and the rapid return of the ram to neutral position once the desired pressure has been reached on the work. The cycle of operation is fully automatic and is controlled by electric push buttons located at the operator's station. The entire opera-



H-P-M Fastraverse Sheet Metal Drawing Press

tion is a stepless range with "inching" and jerky start and stop motions entirely eliminated.

Heat and Glare-Reducing Window Coating

A sprayable coating for factory windows and skylights which is designed to reduce the heat and glare of summer suns has been announced by the Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn. Trade named "3M" Sun-Stop Strip Coating, the

material provides a translucent green film which is said to withstand water, soap and most commercial window-cleaning preparations. Color is claimed to be

permanent.

According to the manufacturer, the coating remains in place indefinitely, yet can be removed easily by an air blast or by being stripped off by hand. The coating is applicable with most conventional paint spray guns or by brush and is provided in pint, quart, gallon, and five-galon containers and 55-gallon drums.

cut. The camshaft for providing the table travel is mounted in large anti-friction bearings and is individually motor driven through a chain and sprocket arrangement. Attached to the table is a work spindle in a housing capable of being swiveled to mill any angle up to 90 degrees. Spindle indexing to suit the work is accomplished by means of index plates activated and locked into position by an air cylinder.

Machine equipment includes a coolant tank and a coolant pump operated by its

Special Purpose Milling Machine

The Whiton Machine Co., New London, Conn., announces a special purpose high production milling machine primarily designed for cutting bevel and spur gears and pinions but also adaptable to other milling operations on work, including workpieces requiring hex, square or more sides to be milled, and so on, The machine has a vertical spindle of generous proportions which is mounted in antifriction bearings and individually motor driven through V-belts to allow for the use of carbide cutters. The spindle unit is ajdustable both horizontally and vertically.

The table is mounted on hardened and ground ways and is actuated by a combination of air and cam to impart the proper rapid advance to and from the cutting position and to produce feed for the

NEW "SNX" PERECO FURNACE FOR SINTERING, BRAZING, ANNEALING by "Straight-Line," 3-Zone System!

Heat range of this compact unit is 1400° to 2750° F. This Globar element furnace is manual pusher type, designed for batch treatment on a "straight-line," 3-zone system. Work moves from purge (preheat chamber), through high temperature area, then water cooled area. Ideally suited for sintering powdered metal, brazing, bright an-

nealing and metal research uses. Gas tight construction throughout. Has counter-balanced doors equipped with automatically operated flame curtains which prevent contamination of furnace atmosphere when doors are open. Connections provided for controlled atmospheres. Unit has high temperature zone area of 4" w. by 4" h. by 12" l. Max.



PERECO makes standard and special electric furnaces for any temperature from 450° to 2700° F.

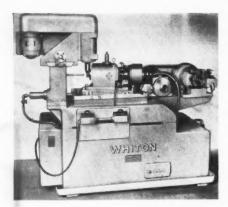
power input 15 K.W. Other muffle sizes available. Write for full details.

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PERENY EQUIPMENT CO.

Dept. P, 893 Chambers Rd., Columbus 12, Ohio



Whiton Special Purpose High-Production Milling Machine

own motor. The machine is designed to accommodate work up to 8 inches in diameter. Cutter speed with high speed cutters is 125 surface feet per minute. With high speed steel cutters the feed is 0.003 inch per tooth, variable to suit the work.

25-Ton Oil-Hydraulic Press

Fast action with high-tonnage pressures under accurate, regulative control is claimed for the "Multipress" 25-Ton Oil-Hydraulic Press announced by The Denison Engineering Co., 1153 Dublin Rd., Columbus 16, Ohio. The press has a 15-inch stroke, 25-inch daylight opening, and 12-inch throat depth.

Approach of the ram to work is variable and can be present at any speed desired up to 530 inches per minute to meet exacting work requirements. Other operational factors that can also be preset include ram stroke length, pressing speed, and ram pressure. Uniform pressure application for every work cycle of the ram is said to be obtained regardless of variations in dimensions of parts being processed.

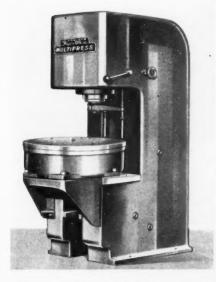
The press may be equipped with a choice of controls, including dual hand lever, single lever, foot pedal, or electric push-button types. It can also be operated with automatic valve controls for single cycling, continuous cycling, or vibratory repeat strokes. Automatic ram cycling also may be used in conjunction with variable speed approach, adjustable pressures, and interlocking hydraulic accessories. Ad ded advantages include



inching control of the ram for quickly locating dies and tooling during set-up

periods.

If desired, a 33-inch diameter hydraulic index table may be installed on the press. The table is arranged to move parts under the press ram automatically and provides indexing for either 6 or 12 stations. Parts can be loaded onto the table at the front of the press, eliminating waiting periods for completion of work cycles. The revolving table, synchronized



"Multipress" 25-Ton Oil-Hydraulic Press

hydraulically with the ram action, accurately positions the parts at the pressing stations. Provision is made for "skipping" non-tooled stations on the index table if required.

Impregnated Gasketing Material

Kown as "Chrome Lock," a zinc chromate impregnated gasketing material for use in a wide variety of industries is now being marketed by the Products Research Co., 5426 San Fernando Rd., Glendale, Calif. Primarily a protective gasketing providing for the exclusion or retention of air, water, dust, and bulk conveyed materials, Chrome Lock is available in tapes, sheets, or stampings.

When installed between two faying



The new Butcher Type Handle on Model No. W85 WHALE Hack Saw Frames gives a better grip on all metal cutting jobs! Superbly balanced, finger-fitted grip of tough rubber composition. Fully enclosed protective design. Rugged Forsberg frame. Order this outstanding Hack Saw Frame from your Mill Supplies Jobber NOW!

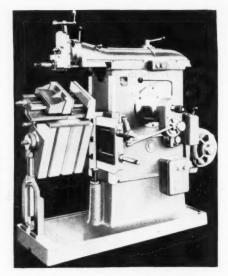


surfaces under bolted or screwed pressure, the material is said to form an absolute dam. In addition, the material is claimed to provide for definite corrosion prevention, electrolysis prevention between dissimilar metals, pressure sensitive resistance, non-oxidation, unusual compressibility, and complete resistance to water and saline solutions.

15-Inch Shaper

A 15-inch Timken bearing equipped shaper for wide machine shop usage is being manufactured under the trade name of Steptoe-Western by the Western Machine Tool Works, 9th and Lake Sts., Holland, Mich. The machine base is a rigid member of extra depth for stiffness and adequately cross-girthed, with depressed top for easy cleaning. A heavy box casting containing all the drive gearing forms the column. The crossrail is an unusually deep box section of close grained semi-steel, with a density of structure particularly desirable for reciprocating surfaces.

Other features of the shaper include a V-type, adjustably gibbed, hand scraped, oil lubricated ram; helical bull gear and



Steptoe-Western 15-Inch Shaper

pinion on Timken bearings; alloy steel drive gears; filtered pressure lubrication to all bearings, ram, and gearing (available on order); V-belt drive (3 belts, adjustable centers); universal revolving table which can be rotated 45 degrees each side of center; involute splined shafts for all sliding gears; centralized speed changes in one handle; Timken bearings on all transmission shafts; eight automatic power cross feeds in both directions; oversize vise graduated for swiveling to 180 degrees; all sliding surfaces planed and hand scraped to master surface plates; positive outboard table support and tilting table top (available on order).



OVERSIZE TAILSTOCK SPINDLE

increases the tailstock capacity of most 9" to 12" lathes from No. 2

TO NO. 3 MORSE TAPER.

Keyslot provided for tang grip and positive hold. For details and prices, write for Folder No. 9. Dealers inquiries are invited.

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Removing broken taps need not call for the purchase of expensive equipment. Walton Tap Extractors have been used for years by toolmakers and mechanics all over the world. They are easy to use, fast, and economical.

Purchase from your dealer, or write us for Folder No. 10 and details of free trial offer.

THE WALTON COMPANY

HARTFORD 10

CONNECTICUT

General Purpose Bearing Grease

The Norma-Hoffmann Bearings Corp., Stamford, Conn., announces that its Norma G-66 "Stability-Tested" Grease is now available for general purpose bearing lubrication. Originally developed for use in Norma-Hoffmann ball and roller bearings to provide lubrication over a wide temperature range without separation, drying out, or hardening, the grease, it is claimed, is highly resistant to oxidation in storage as well as in service, is insoluble in water, and will not emulsify or aerate in the presence of condensed moisture.

Intended for lubricating greasepacked, as well as unsealed, bearings, the grease is supplied in tubes aud larger type containers.

General Purpose Band Saw

The Do-All Model 36-L, a general purpose band saw which is said to be equipped with all essentials for efficient and safe high speed operation on sheet metal, is announced by The DoAll Co., Des Plaines. Ill. The machine utilizes a narrow hard tooth flexible back buttress blade which is claimed to require no resharpening or spring temper up to 2inch width.

The DoAll 36-L has a 36-inch throat and 20-inch maximum thickness capacity. The main work table is 30 x 36 inches with handwheel operated table tilt 45 degrees to the right and 50 degrees to

the left. Auxiliary table is 19 x 19 inches.

New aircraft type hydraulic brakes on both saw carrier wheels and complete saw blade guarding provide maximum safety for the operator. Saw guides are of the adjustable insert type for blades up to 2 inches and have anti-friction thrust bearings.

The machine includes a large capacity dust spout for exhaust connection, spring tensioned upper wheel, counterbalanced saw post, and 36-inch rubbertired saw carrier wheels. It can be furnished with either direct or belted drive



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BUY DIRECT FROM FACTORY

Router Bits for wood or metal

1/8" - 3/32" shank Hoby Shop Rotary Tools

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Mark Down 50% Discount

100,000 Tools in stock at all times.

Immediate Delivery

Distributors Wanted . Open Territory

PATTERSON TOOL CO.

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AUTOMATIC CHUCKING AND INDEXING FIXTURE



1.-1800 light cuts per hour.

2.—Either horizontal or vertical position.
3.—Collets changed instantly.

Automatically knocks piece out.

Model D—Ratchet indexing only—1" cap.

Model E—Both degree and ratchet indexing

—Capacity up to 1".

Model F—Both degree and ratchet indexing
—Capacity up to 24".

Write for Folders

J. W. DEARBORN Ansonia, Conn. for single speed sawing or with stepless variable blade speed control over a range of 1.000 to 5.000 or 2.000 to 10.000 feet per



DoAll Mcdel 36-L General Purpose Band Saw

Drive motors ranging from 3 to 10 horsepower may be used with the machine.

Carbide Tool Grinders

The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, has developed a carbide tool grinder for wet or dry grinding which features substantial construction for vibration-free, accurate and volume grinding and is V-belt motor driven. Available in 1 and 3 h.p. models, the machine incorporates a reversible and totally-enclosed motor and a three-button push button and reversing magnetic starter having overload and under-voltage protection.

Work tables can be quickly adjusted to any angle 15 degrees above and 30 degrees below horizontal with the aid of easily read graduated dials. Each table assembly, guard, and splash pan is adjustable through screw feed to compensate for wheel wear. Each table is equip-



"Standard" Carbide Tool Grinder

ped with a replaceable steel wear plate. Adjustable nozzles supply a copious amount of coolant for wet grinding. Conversion to dry grinding can be quickly effected when required. The machine base incorporates a coolant reservoir, settling chamber, and drain for cleaning.

Lapping Compound

"Timecutter," a lapping compound for manufacturers of metal products ranging from heavy machinery to delicate instruments, is now being marketed by the Timesaver Products Co., 546 W. Washington Blvd., Chicago 6, Ill. Designed to reduce "lapping in" time to a minimum, the compound features an oil base that holds the abrasive grains at the point of contact where they grind rather than roll or squirt away. In addition, the compound washes off in a sludge carrying the silicon carbide away thoroughly.

Timecutter is available in ten different grits ranging from very coarse to microscopic fine.

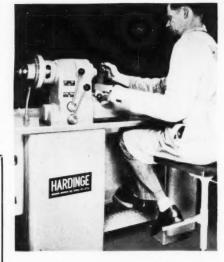
Second Operation Machine

Identified as the Model AC59, a high speed precision second operation machine with air-operated collet is announced by Hardinge Bros., Inc., Elmira, N. Y. The collet is closed and opened by actuating a foot pedal and is claimed to accurately hold work without distortion regardless of considerable variation in the chucking diameter from one piece of work to an-



other, thus making the unit particularly suited for machining automatic screw machine blanked parts, die castings, and so on.

The standard 5C Hardinge collet or step chuck may be instantly closed or opened when the spindle is at rest or at any speed up to 4,000 r.p.m. The preloaded ball bearing center-drive headstock spindle has a 1-inch round, %-inch hexagon, and %-inch square collet capacity. The maximum step chuck capacity is 6 inches. Eight spindle speeds are available in either forward or reverse direction from 250 to 4,000 r.p.m. Three other speed



Hardinge Model AC59 Second Operation Machine

BORING HEADS Micrometer offset screw

ground from solid.

Large, easy to read dial

graduated in .001"
Tool block hardened, ground and fitted to

ground and fitted to body.

"V" tool block holds

any size bar rigid.

Interchangeable shanks and arbors.

USED FOR 30 YEARS IN TOOL ROOMS AND PRODUCTION SHOPS FOR PRECISION BORING

i	Head No.	Body Die.	Maximum Bar Capacity	Micro Offset	Price
	6	176"	36"	1/4"	\$ 22.
	8	314"	34"	1/2"	30.
	10	4"	34"	1/2"	70.
	12	4"	34."	1 "	45.
	20	71/2"	11/2"	1"	125.
0	30	4"	3/4 "	134"	70.
1	32	516"	1"	2"	115.
	35	4%"	4"	11/2"	85.
1	36	634"	114"	2"	150.

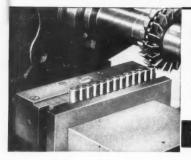
FLYNN MANUFACTURING CO.

ranges are available for varied production requirements.

Additional machine features include precision hardened and ground dovetail bed ways; constant full bearing double tool cross slide; automatic indexing sixposition preloaded ball bearing turret; self draining oil pan with integral sump; and welded steel pedestal base.

Hydraulic Automatic Lathe

Identified as the No. 24, a hydraulic automatic lathe with swing over bedways of 35½ inches is announced by the Gisholt Machine Co., Madison 10, Wis. Standard equipment includes front and



GANG VISE PREW FOUNDERING

FASTER • CHEAPER • MILLING AND GRINDING Solid jaw and body holding a series of equalizing pads. Solid jaw is locked to body with screws and work inserted. "V" grooves and equalizing pad form a 3 point chuck for each piece of work. Pads and grooves of solid jaw are same width as diameter of work.

WRITE FOR COMPLETE DETAILS

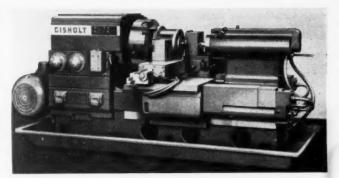
GETU) TOOL & DIE CO., PINE MEADOW . CONN.

Gisholt No. 24 Hydraulic Automatic Lathe

rear carriages, each with its own auxiliary slide. Each slide has its own feed pump and controls and can be mounted to traverse and feed at any angle to the spindle center line.

Spindle speeds are selected by pick-off gears.

pick-off gears, and the starting and stopping of the spindle are effected as part of the automatic cycle. Setting up is simplified by hydraulic controls which permit the slides to run separately, stop at any point, back up, or continue the cycle.



Motor Drive

An economical Thy-mo-trol drive designated as the Type H1 has been announced by the Control Division, General Electric Co., Schenectady 5, N. Y. Fur-



nished in ratings through 1/2 h.p., the drive utilizes a simplified half-wave circuit to provide d.c. flexibility from a.c. power. It is specially designed to provide, by the turn of a knob at a single control station, smooth stepless speed control on small lathes, grinders, drill presses, conveyors, pumps, packaging equipment, and paint and varnish mixers.

The drive is arranged for operation on 220 volts. 60 cycle a.c. (For other voltages a suitable anode transformer is available). It has a 20-to-1 speed range from 1.725 to 86 r.p.m. and is said to operate efficiently in ambient temperatures from



G-E Type H1 Thy-mo-trol Drive (Cover Removed) Applied to Small Bench Lathe

50 to 104 deg. F. The drive is furnished in either a non-reversing or reversing type, the latter being equipped with a separate magnetic reversing switch.

Designed for constant-torque loads, the drive, under normal conditions, is claimed to have excellent speed regulation from no load to full load. The speed may be preset or may be varied during operation and under load. Dynamic braking permits quick stopping. With normal industrial voltage fluctuation the drive is said to operate satisfactorily, although it does not compensate for changes in line voltage. Maximum tube life is claimed to be obtained when the voltage fluctuates no more than five per cent.

The electronic panel is mounted in a compact, ventilated N.E.M.A. Type 1 enclosure. The equipment is said to be easy to wire since the terminals are located





1096 North River Road . St. Clair, Michigan

at the front of the panel and separated from the tubes by a protective cover. The complete drive may be easily installed, either separately or directly on the machine, and is claimed to require little maintenance.

Diamond Abrasive Compound

A diamond abrasive compound now being manufactured by the Industrial Products Division, Elgin National Watch Co., Aurora, Ill., can be used in finishing carbide and hardened steel parts, draw-

ing dies, and bearings surfaces; the precise lapping of hardened gages; polishing the cutting edges of all types of cutting tools, and so on.

The compound includes a synthetic vehicle which carries the diamond abrasive and extremely precise size grading of the actual diamond particles. The synthetic vehicle, it is claimed, resists caking or drying out, is universally soluble in commercial solvents and water, and leaves no dulling film on finished surfaces.

Adjustable Tote Pan Lift Truck

The Lyon-Raymond Corp., 1294 Madison St.. Greene, N. Y., announces a tote pan lift truck which is adjustable in width and lowered height, thus allowing it to be used with practically all standard tote pans ranging in width from 8 to 24 inches.

The width of the truck is adjusted by simply loosening eight set screws and contracting or expanding the telescopic frame as required. The lowered height is changed by raising or lowering the side plates which are fastened by four bolts.

The truck is available in two styles, a narrow model designed to handle tote pans from 8 to 16 inches wide and a wide model designed to carry pans ranging in width from 16 to 24 inches. The lowered height of the lifting forks can be adjusted from 2½ to 7½ inches. The forks which lift and carry the pans are 22 inches long. Loads up to 1,000 lb. can be elevated by a single downward movement of the tow-

IN WORKING

Aluminum

the lubricants used largely determine the results

FISKE Lubricants are used in progressive metal-working plants that efficiently produce the highest types of products, with minimum shortage and tool wear.

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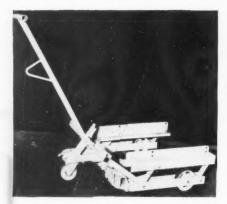
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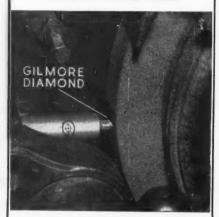
METAL WORKING LUBRICANTS



Lyon-Raymond Adjustable Tote Pan Lift Truck

ing handle. The forks automatically lock in the raised position and are released by a simple pedal arrangement. Steering is simplified by a 4-inch swivel caster mounted at the front of the truck. The capacity load is said to be rolled easily on two Finch wheels.

GILMORE DIAMOND TRUING TOOLS



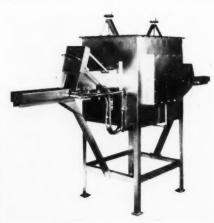
Quality diamonds that render long service, and reduce truing costs. Send for illustrated Cat. No. 45.

F. F. GILMORE CO. 285 Columbus Ave., Boston 16, Mass.

Electric Sintering Furnace

The Pereny Equipment Co., Dept. P, 893 Chambers Rd., Columbus 12, Ohio, has announced an electric furnace, designated as the Model "SNX," which is designed specifically for use in sintering powdered metals, brazing, bright annealing, and many metallurgical research problems. The normal heat range is 1,400 to 2,500 deg. F., with "flash" firing available to 2,750 deg. Fahrenheit.

The Model SNX is a Globar element furnace of the manual pusher type, designed for batch treatment on a "straight-line" three-zone system. Both furnace doors are counterbalanced and equipped with automatically operated flame curtains to prevent contamination of the furnace atmosphere when the doors are open. Adjustable intermediate silicon carbide doors are provided between the preheat and high temperature zones, as well as between the high temperature and cooling sections, to permit



Pereny Model "SNX" Electric Furnace

flexible adjustment of the tunnel clearance and to conform to varying sizes of materials being heated or processed through the furnace.

The furnace has a high temperature zone area of 4 inches wide x 12 inches long. The maximum power input is 15 kw.

Geared Receding Die-Stock

Identified as the "Leader" No. 54 Geared Receding Die-Stock, a pipe threading tool strongly built to withstand the strain

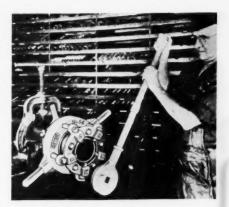
when used with a drive shaft for power operation with a portable pipe machine is now being made by The Oster Mfg. Co., 2057 E. 61st St., Cleveland 3, Ohio. For hand operation the tool is used with a ratchet handle.

The Leader No. 54 Geared Receding Die-Stock has a drive gear with tensile strength of 40,000 to 60,000 p.s.i. The steel pinion operates in needle bearings and is supported by a tubular steel housing. The pinion has machine cut teeth and is com-

pletely hooded.

The complete tool is furnished with four individual sets of dies, each set having five individual and replaceable segments. Each set of dies is designed to thread one pipe size only. The four standard pipe sizes are $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inches. The die holder is a separate unit which is readily replaceable and is adjustable to permit cutting oversize and undersize threads.

The lead screw is designed to prevent jamming when power-driven by an inexperienced operator. The universal chuck has three powerful quick-acting fully servated jaws with square head locking screw. Graduations on the pinion shaft housing indicate the correct length of thread to be cut.



Oster "Leader" No. 54 Geared Receding Die-Stock in Use

The lifting handles of the unit are carefully balanced at the center of gravity so that the tool can be readily placed in position on the pipe. The design of the gear body hood permits easy backing off of the tool when the dies recede slightly from the cutting position. This arrange-

Relance GENERAL PURPOSE DRILL RODS

RELIANCE flats and squares are smooth-drawn pieces of high carbon stool store, accurate, true to shape, readily machineable. For punches, tools, dies, gages, stamps, and precision parts.

RELIANCE flat and square drill rods are obtainable from fine steel distributors and mill supply houses everywhere, same as Dukane, Warplis, and other standard grade-of rounds.

Send for Pittsburgh's folder on drill rods.

PITTSBURGH TOOL STEEL WIRE CO.
MONACA-PENNA.

STOP



ELK TOOL HOLDERS, Precision Built, eliminate bit vibrations. Universal—Straight, Right or Left Hand Positions. ONE will replace TEN single purpose Tool Holders.

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ELK TOOLS, Inc.

71 W. Broadway

New York 7, N. Y.

50% INCREASE PER



SCHAUER speed lathes

Users report 50% to 90% more production in polishing, lapping, or burring by use of Schauer Speed Lathes. Find out how you can use these low-cost, high-production machines for your secondary finishing operations. "Save with Schauer." Write for Catalog 480.

THE SCHAUER MACHINE CO

• ORIGINATORS OF TODAY'S SPEED LATHES
2060 Reading Rd., Cincinnati 2, Ohio, U.S.A.

ment is said to prevent the dies from binding or cutting as the tool is retracted and to also help to avoid chipping the teeth on the dies.

All-Steel Electric Hoist

An electric hoist featuring an all-steel construction and gear train plus Tru-lay preformed cable and swaged-on cable fittings has been added to its "Speedway" hoisting equipment line by the Wright



Wright All-Steel "Speedway" Electric Hoist

Hoist Division, American Chain & Cable Co., Inc., York, Pa. Other construction features include ball bearing, fully enclosed N.E.M.A. motors; splined connections; grooved steel cable drum; jaw type brake; rabbeted male and female frame connections; push-button controls; Hyatt roller bearings; and safety limit stop.

Available in capacities from 1.000 to 20,000 lb., the Wright All-Steel Speedway Electric Hoist is built for operation on 220 volts, 3-phase a.c. and is reconnectable for use on 440 volts, 3-phase a.c. The hoist can also be furnished for 115 and 230 volts, d.c. and for other voltages and frequencies in either 3-phase or 2-phase applications.

Heavy Duty Packaging Tape
As an addition to its line of "Scotch" brand products, the Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn., announces a filament tape, designated as the No. 880, which is designed for packaging metal pipe, rods, sheets, and coils by being wrapped once around the load and back on itself. Made with an acetate film backing, the tape is claimed to be waterproof; unusually thin to permit easy handling; and extremely tough due to a construction in which thousands of long thread-like filaments reinforce the backing. The pressure-sensitive adhesive of the tape is claimed to grip immediately on contact.

Name Plate Marking Machine Identified as the Model 222, a bench

style pneumatic marking machine recommended for the production marking of name plates where there are frequent changes in character alignment and name plate size has been developed by Jas. H. Matthews & Co., 3944 Forbes St., Pittsburgh 13, Pennsylvania.

Designed for simple operation and quick and easy type changes, the machine is said to mark a maximum size name plate 51/2 inches left to right x 4 inches top to bottom when the marking area is located in the center of the plate. The maximum marking area is 3 inches left to right x 2% inches top to bottom





Matthews Model 222 Name Plate Marking Machine

when an air cylinder with 5-inch stroke is used. The maximum marking area is 4½ inches left to right x 2¾ inches top to bottom when an air cylinder with a 6½-inch stroke is used.

The "T-Face" steel type used is made

The cutting edges are accurately machined, and then hand-honed for a lasting keenness!

TOOL No. 40
High Leverage Diagonal Pliers
7"

SEE
YOUR
DEALER

UTICA DROP FORGE & TOOL CORP.
UTICA 4, NEW YORK

from hardened and tempered tool steel, with each character centered on the steel blank to avoid uneven lines. The type is available in three standard sizes of $\frac{1}{16}$, $\frac{3}{3}$, and $\frac{1}{8}$ inch.

Specifications of the Model 222 are as follows: table space, 28¼ x 18½ inches; height, 20½ inches; weight, 380 lb.; shipping weight, 430 pounds.

Coolant Grinding Attachment

A mist type coolant grinding attachment for its No. 2 cutter and tool grinder has been announced by The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. Intended for carbide grinding, the attachment consists primarily of a floor unit composed of a coolant tank, pump and suction fan; a large diameter flexible return tube and a small diameter supply tube to the grinding wheel; and a guard which completely surrounds all but the face of the wheel.

In operation, a thin stream of coolant



Mist Type Coolant Grinding Attachment Connected to Cincinnati No. 2 Cutter and Tool Grinder

is directed to the rapidly rotating wheel which transforms the coolant into a fine mist that is immediately returned via the suction tube to the coolant tank. Thus, a small amount of coolant continually circulates on a non-stop round trip. The attachment can be readily removed when it is desired to change from carbide to high speed or carbon steel cutters.

"Cloverleaf" Grind for Collets

A new grind on the external bearing surfaces of all of its collets used for hexagon and square, as well as round, stock has been introduced by the Sheffer Collet Co., Traverse City, Mich. Identified as "Cloverleaf," the grind provides a cam relief at the slots so that a positive bearing is obtained in the center of each jaw section. The cam form is said to provide for a tighter lock than heretofore with less strain on the chucking mechanism and free release regardless of stock variations or worn conditions of either the collet or spindle.

Improved Air Valve

Said to increase efficiency in performing cleaning, drying, cooling, positioning, machining, and ejecting operations, an improved "Air-Saver" Air Valve announced by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Mich., is precision built to provide split-second air control at all times. The valve may be mounted in any position to operate at any desired angle, unaffected by machine vibration.

With the valve, ample air volume is obtainable for the operation of multiple as



Palmer-Shile Improved "Air-Saver" Air Valve

well as single jets. The valve may be built into new machines or mounted on equipment already in operation.



Universal Lathe Chuck

The Westcott Chuck Co., 70 E. Walnut St., Oneida, N. Y., announces a four-inch three-jaw universal chuck having a semisteel body, set of reversible jaws, and hub which is available threaded 1"-8, 1"-10, or 1"-12 for screwing directly onto the spindles of popular metal-working lathes. No adapter is required.

Bench Shear

A high speed shear with 18-inch throat, to be known as the "Nib-Shear," is announced by the H-A Manufacturing Co., Dept. MMS, 444 Salem St., York, Pa. Designed to shear any material from paper to stainless steel, the machine provides a clear view for cutting and is said to produce clean edges with a minimum of distortion. No starting hole is required for inside work.

Construction features of the Nib-Shear include a universal motor base, quick and ample belt adjustment; manganes e bronze connecting rod; hardened steel replaceable cam; two straddle bronze bearings; hardened steel wrist pin; %-inch o.d. drive shaft. ½ h.p. 115-volt single-phase a.c. motor with switch: heavy



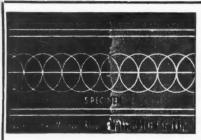
"Nib-Shear"

close grained cast iron frame; 3-point lubrication; special cam operated anvil for starting internal work; and end plates of close grained cast iron. The machine, which provides for quick cutter adjustment or replacement, has a capacity for 14 gauge mild steel and 16 gauge stainless steel. Constructed to take a 1-inch radius cut, the unit measures 28½ inches long overall x 25½ inches high overall and has a net weight of 172 pounds.

HAVING A METAL JOINING PROBLEM? Ask Us-Over 100 ALLOYS to solve Gas or Arc EUTECTIC WELDING BRAZING **EUTECTIC WELDING** SOLDERING ALLOYS CORP. - DEPT. P Hard Surfacing Worth Street, New York 13, N. Y Fluxing problems 160 Field Engineers to Help You

Precision Boring Machine

A precision boring machine for accurate, high production boring, turning, and facing now offered by the Covel Mfg. Co.,



America's Welding Alloy

DYKEM STEEL BLUE

Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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THE DYKEM COMPANY

2301F NORTH 11th ST.

ST. LOUIS, MO.

(In Canada: 2466 Dundas St., West, Toronto, Ont.)



Covel Single-End Precision Boring Machine

Benton Harbor, Mich., features controls which permit instant selection of any one of three automatic cycles and a convenient "inching" control for setting up. All push-button stations are grouped in one inclined panel for easy reaching and viewing by the operator.

The cartridge-type spindles of the machine have permanently lubricated preloaded bearings. The ways are provided with automatic lubrication, and the spindle motors are mounted above for convenient maintenance and short, efficient V-belt drives. The machine is available in several models of both single and double-end types.

Portable Tool Balancer

In line with the efficiency trend to keep work spaces clear and tools within easy reach, the Keller Tool Co., Grand Haven, Mich., announces a portable tool balancer which is designed to suspend tools weighing up to 10 lb. near the working area for instant use and is adjustable to all tool types, remaining vertical under all operating conditions. The unit has a working range of 6 feet.

According to the manufacturer, little effort is required to bring tools to the job when using the balancer. At the completion of the operation, the tool is released and returns to its preadjusted position near the work area. Adjustments of







For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for trial sample and circular.

MICHIGAN CHROME & CHEMICAL COMPANY
6340 E. Jefferson Ave. + Detroit 7, Mich.

the "up" position are made by moving a clamp and rubber bumper up or down on the wire rope of the balancer. Cable tension can be accurately regulated by means of a nut and lock, both located on the same side of the balancer.

The housing of the Keller Portable Tool Balancer is of aluminum with clock-type

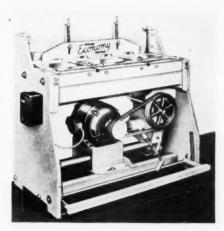


Keller Portable Tool Balancer in Use

suspension spring mounted on oilless bearings. The balancer weighs 5% pounds.

16-Gauge Capacity Metal Shear

A power-operated 16-gauge capacity metal shear incorporating a unique self-contained positive action direct drive unit is being marketed under the designation "Economy" P-16 by the Acme Equipment Co., Inc., 126 S. Clinton St., Chicago, Ill. The drive unit, which operates in oil, consists of precision cut hardened steel worm and bronze worm gear units, sliding 4-jaw clutch, driver, and cam which provide the shear a direct



"Economy" P-16 Shear

action with slight pressure on the foot treadle. One complete revolution in which the knife bar is brought down smoothly for the cut and returned to its top position is accomplished each time the foot treadle is depressed.

The operating cycle of the shear is 60 strokes per minute but can be varied if desired. Available in three cutting lengths of 36, 42, and 52 inches, the shear is powered by a 2 h.p. motor in the 36-inch size and a 3 h.p. motor in the 42 and 52-inch sizes.

Automatic Dial Index Feed

Known as the "Speedex," an automatic dial index feed for punch presses is now being offered by de Castro & Associates, 2477 Randolph St., Huntington Park, Calif. The standard table of the feed is 12 inches in diameter, with larger tables available on special order. Ample space is provided for air ejectors and automatic loading mechanisms. The die space on the rear of the table is $3\frac{1}{2} \times 3\frac{3}{4}$ inches. The overall height is $3\frac{1}{2}$ inches.

According to the manufacturer, the Speedex Dial Feed Table can be adapted to any ordinary punch press, large or small, without altering the press. The unit is driven by means of an eccentric on the crankshaft of the press. Due to the design of the positive feed mechanism, the Speedex is said to repeat and lock itself at each stroke of the press. Gear and locking mechanisms are hard-



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STANDARD SIZES

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STERLING FACTORY EQUIPMENT CO

183 CHARLES ST. PROVIDENCE, R. L.



"Speedex" Automatic Dial Index Feed

ened and ground. The table rotates on double row ball bearings and all wearing points are bronze bushed.

The Speedex is claimed to increase production in performing second operation

work, such as assemblying, broaching, and the like, by permitting the press to operate continuously, either hand fed or fed by means of a magazine or hopper.

Extension Cradle Roll Fixture

A telescoping extension cradle roll fixture has been developed by The Acromark Co., 9 Morrell St., Elizabeth 4, N. J., for the easy marking of varied length cylindrical parts, such as fuses, tubes, bushings, rods, shafts, mandrels, and so on, in its Model 9A marking machine. Although developed for use in a marking machine, the fixture is also adaptable to other uses where varied lengths of tubular or solid cylindrical parts are to be worked.

The fixture consists of two sets of cradle rolls, both adjustable for diameter and both mounted on a main plate. One set of rolls is permanently mounted, adjustable only for diameter of part to be

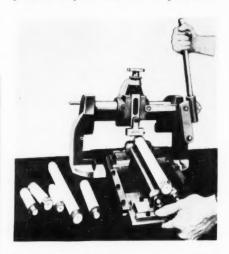


Illustration Showing Extension Cradle Roll Fix-ture Being Used in Conjunction with Acromark Model 9A Marking Machine

marked. The other set of rolls is mounted on a slide plate. As the adjustable set of cradle rolls is pulled out, the shafts pull out also, stopping when the limit of shaft length has been reached. Free rotation of the rolls is provided by Oilite bearings in small size cradle rolls and by precision roller bearings in large size rolls.



MINEOLA, N. Y.

Carbide Tool Grinder

Product of the Willey's Carbide Tool Co., 1342 W. Vernor Highway, Detroit 1, Mich., the Willey's Model 60 Carbide Tool Grinder illustrated herewith is designed for the freehand grinding of tungsten carbide tipped tools, as well as other hard metal tools requiring keen cutting edges and extreme accuracy. The machine is sturdily constructed and can be used for rough, semi-finish, and finish grinding.

Equipped for wet and dry grinding, the Model 60 is designed to use an 8-inch vitrified wheel for rough and semi-finish



Willey's Model 60 Carbide Tool Grinder

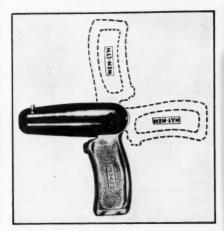
grinding and a 6-inch diamond or vitrified wheel for finish grinding. A cool cutting action of the wheels is said to be ensured by a steady flow of coolant, force fed by an electrically driven pump mounted inside the pedestal.

11-Inch Swing Lathe

An 11-inch swing lathe available with a 1-inch collet capacity for draw-in collets and center distances of 24 and 36 inches is announced by the Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill. Features include a heavy headstock combined with a preloaded ball bearing spindle mounting to assure sustained accuracy at all spindle speeds from 45 to 1,500 r.p.m. without bearing adjustment.

HAMMER

with All Angle Head



It's an indispensable shop tool!

Now, you can reach easily those hardto-get-at places, because the head is adjustable—quickly and easily—to any angle through a full 180° arc. A single binding screw securely locks the head in position . . . Rugged, Compact . . . the Air Hammer weighs only 3½ lbs. Operates on pressures up to 150 lbs.

SOME OF MANY USES

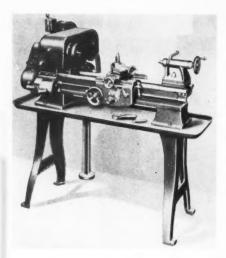
Removing cores from sand castings. Sheet metal cutting.
Removing barnacles from ships.
Star drill work—1/4" to 3/4" holes.
Chipping.

Write for Bulletin to see how this hammer can help you.

ACME TOOL CO.

69 W. Broadway

New York 7, N. Y.



Logan 11-Inch Swing Lathe

Total spindle runout is said to be held to within 0.0005 inch 12 inches from the bearing.



The two V-ways and two flat ways of the heavy rugged bed are precision ground to a tolerance of 0.0005 inch along the lineal capacity of the lathe. Self-lubricating bronze bearings protect against wear. Full quick-change gear equipment provides for instant selection of 48 threads and feeds.

The Logan 11-Inch Swing Lathe is available in cabinet and bench types, as well as conventional floor types.

Muffle Furnace

Housed in a cylindrical shell mounted on a pyramidal type base with practically line contact between them so as to allow free circulation of air and to eliminate trapped heat in the base, a muffle furnace announced by the Hevi Duty Electric Co., Milwaukee 1, Wis., is designed primarily for general laboratory requirements such as drying of precipitates, ash



Hevi Duty Muffle Furnace

determinations, fusions, ignitions, heating metals and alloys, enameling and ceramic firing, heat treating, and general experimental work.

Outstanding features of the furnace include efficient insulation design to minimize radiation loss; 36 steps of control through a tapchanging transformer; recessed position for controls which affords full protection; and easy accessibility to instruments through readily removable panels.

Industrial Battery Charger

The Baldor Electric Co., 4380 Duncan Ave., St. Louis 10, Mo., has developed a



Baldor Model AR60 Industrial Battery Charger

fully automatic charger for lead acid batteries of three or six cells. Designated as the Model AR60, the unit is designed to charge at a maximum rate of 60 amperes and is said to be satisfactory for batteries of 550 ampere-hours or less. According to the manufacturer, the charger is fully automatic in that it has a voltage relay to shut down the initial fast rate to a safe soaking rate.

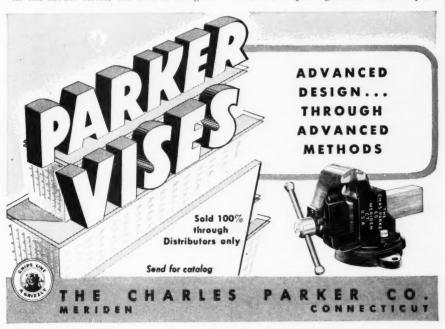
Surface Comparator

An electronic comparator which is said to provide for accurate surface control of machined parts as quickly and easily as routine demensional checking has been announced by the Merz Engineering Co., 200 S. Harding St., Indianapolis 7, Ind. Known as the Merz Pico Surface Comparator, the unit is designed to check surfaces electronically against an approved sample and to assure instant, accurate meter readings.

The comparator is entirely self-contained in an aluminum case, complete with carrying handle and storage drawer. Overall dimensions are 11 x 9 x 7 inches. The units weighs approximately 15 lb. and can be operated from any 110-volt

60-cycle outlet.

The Merz Pico Comparator consists of a meter, exploring head, and adapter.





Merz Pico Surface Comparator

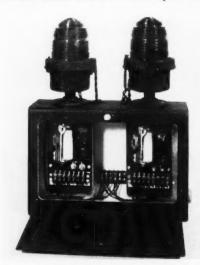
Readings can be taken in 5 seconds simply by pressing the head against the surface being checked, touching the actuating button, and comparing the meter reading against the master reading. An outstanding feature of the unit is its knife-edge meter pointer which reads only one point on the scale, thus eliminating calculations or averaging.



Light Signal Device

A self-contained light signal device for use with the P & W Model D Electrolimit Continuous Gage or "flying mike" has been announced by the Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn. The device can be arranged to signal the operator of a rolling mill continuous inspection line or a shear by means of lights when the strip material is "off gage," or it can be used to control an external circuit for classifying.

The P & W Light Signal Device consists of one red and one green lantern. two electronic relays, and a suitable mounting case. The limits are set on the contact meter and when these plus and



P & W Light Signal Device

minus limits are exceeded, an electric contact is made through the relays, thus providing a control circuit which can be used for controlling mechanisms and lighting lights.

Gear Hobber

A machine for the high speed, accurate hobbing of small spur, spiral and bevel gears has been developed by The Hamilton Tool Co., 828 S. 9th St., Hamilton, Ohio. Identified as the No. 1, the machine is designed to handle work from 0.050 to

6 inches o.d and provides 12 hob speeds from 109 to 1,259 r.p.m. The hob spindle turntable can be swiveled 105 degrees to the left and 135 degrees to the right.

The machine affords helix leads from 0.800 to 130 inches and operates on a 1 h.p. motor. Speed, feed, and indexing can



Hamilton No. 1 Gear Hobber

be selected independently to suit any material being worked and any size gear being hobbed.

Radial Relieving Attachment

The Royal Oak Tool & Machine Co., 621 E. Fourth St., Royal Oak, Mich., announces an accessory for its D-S grinding fixture which allows for the radial relief grinding of long tools not equipped with centers. The accessory is designed for mounting on the bars provided as standard equipment of the fixture and holds the tool close to the end for grinding support. A clamp is also provided to afford extra rigidity to the unit.

The accessory is arranged to swivel on the top bar so that tools with large shanks can be inserted from the back



AMC 2uich DEMAGNETIZER



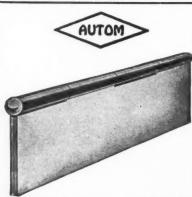
A necessity where machine tools are used.

Standard units available.

Write today for descriptive circular.

ALOFS MFG. CO.

1622 Madison, Grand Rapids, Mich.



CONTINUOUS HINGES

Manufactured by

AUTO MOULDING & MFG. CO.

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Radial Relieving Attachment for D-S Grinding Fixture

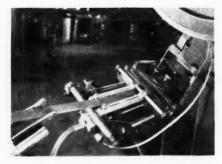
and to also eliminate the necessity of moving the fixture from set position when the same form is being ground on more than one tool. Standard drill bushings and liners can be inserted for any size tool up to 13% inches in diameter.

Automatic Air Feed

Designed to provide for the automatic feeding of sheets, channels, bars, and so on, in a wide range of thicknesses and widths, an air feed unit designated as the "Feedmaster" is being produced by Great Western Tools Inc., 3811 Riverside Drive, Burbank, Calif. Light in weight, the unit can be quickly and easily attached to punch presses, drill presses, spot welders, and other equipment. The length of feed can be adjusted to micrometer accuracy.

Under normal shop air pressures, the Feedmaster can be operated at 300 strokes per minute. The unit may be mounted to operate left to right, right to left, front to back, or push-pull on any press.

"Feedmaster" Air Feed Unit



Solid Carbide Reamer

The Atrax Co., 240 Day St., Newington 11, Conn., is now producing a solid car-



Atrax Solid Carbide Reamer

bide reamer having a standard or odd number of straight flutes and a radius relief chamfer, with all lands highly lapped. The reamer is available in diameters

from 3 up to approx x i mately 1 inch. The smaller sizes are made of solid carbide rod, and the larger sizes have solid carbide heads brazed to steel shanks.

The tool can be used in reaming all kinds of heat-treated steel of a hardness up to 65 Rockwellas soft steel, stainless steel, steel alloy, aluminum, phosphorbronze, brass, oilless bearings containing graphite, and so on.

Precision Plumb-Level

Identified as the Type E, a precision plumb-level for use on ma-chines with both horizontal and vertical surfaces which must be held square to close limits is now being manufactured by the Wm. B. Fell Co., 320 Mc-Lain Ave., Rock-ford, Ill. The movable corner plates of the level are designed to fit against the 90-degree corner of a vertical surface. Special plates can be furnished to fit other angles.

In using the Fell Type E Plumb-Level, the horizontal surface or bed of a machine must first be leveled. The plumblevel is then held firmly by the knurled insulating handle against the vertical ways. An error one or two tenths of a thousandth of an inch is said to be indicated, depending upon the accuracy of the surface being checked.

The Fell Type E Plumb-Level meas-

The Fell Type E Plumb-Level measures 5 x 5 x 12 inches in size and utilizes two precision level glasses, one for horizontal leveling and one for vertical



CLIP THIS COUPON

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du MONT'S Minute Man® KEYWAY BROACH KITS...



what they do for you, what they cost, how much time and money they save you cutting keyways in gears, milling cutters, pulley hubs, collars, couplings, etc.

This Kit may be worth a lot of money in your shop. It only costs a postage stamp to find out!

THE du MONT CORPORATION Greenfield, Massachusetts

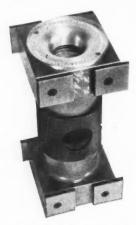
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Company.....

Address

Name and Position

or plumb. The glasses are graduated in 0.0005-inch-per-foot spaces both ways so as to provide a quick and accurate



Fell Type E Precision Plumb-Level

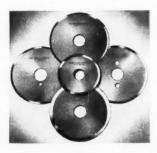
method for squaring vertical parts of a machine with the horizontal parts and for indicating precisely the amount of



lean in any direction. All chance for error is said to be eliminated since bubble readings are self-checking by turning the tool halfway around. Bubbles float in ethyl ether and are claimed to be very sensitive to the slightest change in level, coming to rest accurately without washing back and forth. The level is furnished complete with a finished wood case.

Rotary Pipe and Tube Cutoff Wheels

The Continental Machine Co., 1952 Maud Ave., Chicago 14, Ill., has increased its facilities for manufacturing cutoff wheels for rotary pipe and tube cutoff machines of all makes. Properly hardened, drawn, ground, and tested to pro-



Continental Rotary Pipe and Tube Cutoff Wheels

vide for a maximum number of cuts without regrinding, the wheels are available in standard diameters of 7 inches and standard thicknesses of $\frac{3}{16}$ and $\frac{1}{28}$ inch. They can be furnished with $1\frac{3}{14}$ -inch bores. Special size wheels can be made to specifications.

LUERS

PATENTED CUTTING OFF TOOL HOLDERS PATENTED CUTTING OFF BLADES

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured by

J. MILTON LUERS. 12 Pine Street, Mt. Clemens, Mich.

Produced under License Issued by John Milton Luers Patents Inc.

Articulated Flexible Coupling

An articulated flexible coupling, designed to accommodate heavy loads under severe operating conditions without thrust on the driving or driven member and without distortion, backlash or chatter, is now being manufactured by the Estey Co., 547 N. Main St., Canandaigua, New York.

The construction includes an extra large synthetic rubber spider (temperature and oil-resistant) which provides for maximum shock absorption and resistance to high torque. A steel retaining ring molded and bonded to the synthetic rubber spider is said to prevent distortion



Estey Articulated Flexible Coupling

and rapidly dissipate heat generated by misalignment. The steel spider ring is also claimed to allow the coupling to

TOOLS LOCATED IN LESS TIME

Rotabin Storage Methods Save Time, Tools and Space

A large, nationally known manufacturer effected great savings in tool room operation by reorganizing the layout to include Rotabins.

The time saved by stock clerks in locating and issuing tools is at least 75%.



Floor space is reduced up to 50%. Overcrowding which formerly existed was eliminated and future expansion is amply provided for. All tools are stored within easy reach; the need for ladders eliminated.



Rotabins can quickly return the entire cost of tool room modernization. Let F-G-M engineers help you.

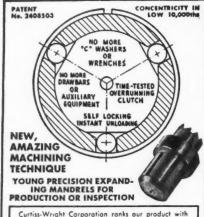
Write, wire or phone to The Frick-Gallagher Mfg. Co., Sales Office: 405 Shubert Building, Philadelphia 2, Pa., for illustrated catalog 106-A which contains complete information.



operate at high speed without damage or breakdown of the synthetic rubber spider from torque and centrifugal force. The steel driving lugs, milled from steel bars with concave surfaces, fit into the convex surfaced cavities of the spider and tend to compress the synthetic rubber, reducing vibration to a minimum.

Air Impact Wrench

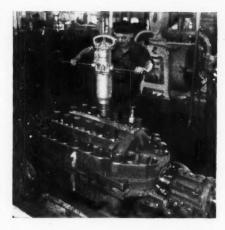
For production and maintenance work, the Ingersoll-Rand Co., 111 Broadway, New York 4, N. Y., has developed a large



Curtiss-Wright Corporation ranks our product with their best tools. Cleveland Graphite Bronze Company, leading bearing manufacturer, states new high accuracy reached, plus substantial production boosts.

ROUGHLY SKETCH DESIRED MANDREL INTO YOUR PART PRINT AND FORWARD FOR QUOTES.

YOUNG ARBOR CO. • Ph. Tower 1-3076
2140 Scranton Road, Cleveland 13, Ohio



Ingersoll-Rand Size 577 Impact Wrench in Use

capacity air impact wrench designated as the Size 577. Designed to handle large studs, bolts, nuts, and cap screws from 1½ up to 2-inch thread size, the wrench operates on the rotary impact principle by which motor torque is converted into 1,000 powerful rotary impact blows per minute.

External Hone

For producing precision external diameters quickly and economically, The Motch & Merryweather Machinery Co., Penton Bldg., Cleveland 13, Ohio, is offering the Delapena External Hone illustrated herewith. Designed to correct ovality, remove taper, and produce micro-finishes, the hone consists of a body member into which is readily fitted one of a series of guide blocks, together with

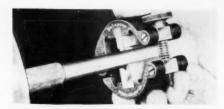


A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought a more accurate and surprisingly faster way of transferring blind screw holes.

The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in \(\frac{3}{16} \)" to 1" diameters. Send for price list.

HEIMANN MFG. CO.
330 Lincoln Ave. Urbana, Ohio



Delapena External Hone

stone holders to suit the diameter of the work to be honed. The body member

c o m p r i s e s two hinged parts which are held apart by a spring against an adjustable stop or control screw.

Three types of stones are supplied for the honing of work; namely, roughing, finishing, and polishing stones. The stones are mounted on holders which may be readily mounted in the hone body. A truing stick is provided to ensure proper alignment of the honing stones with the guide block.

The Delapena External Hone is available in sizes for honing all diameters between ½ and 1 inch.

Wire Stripper

A hand type, pocket-size wire stripper designated as the "Stripmaster" is announced by Ideal Industries, Inc., 1031 Park Ave., Sycamore, Ill. Featuring an "automatic" cam action that releases the jaws, the unit permits wire to be

removed after stripping so that the crushing of stranded wire is eliminated.

The Ideal Stripmaster is designed for stripping building, fixture or telephone wire, lamp and portable equipment cords (individual conductors), automotive wiring, radio and instrument wire and cable, switchboard and aviation wire, and FM and TV down lead wire. Light squeeze pressure on the handles of the tool causes the wire to be gripped, the insulation cut and the wire stripped, all in one operation. As the handles are released, the grippers automatically free



LINDERME 2-Spindle Head

"increased production from 160 to 600 an hour"

This story is typical of the many applications of Linderme 2-spindle drill heads on long and short runs. You'll like these features: drills, taps—in metal wood, plastics; quick, accurate adjustment, ½" to 6" centers; two minute set-up on most drill presses in

your shop; anti-friction bearings, rugged gearing, quality machining—and Linderme's low initial cost for Overarm or Sleeve Types—Twelve models, capacities up to ¾", available with G.M. Sleeves or Morse Tapers. Write for complete catalog.

LINDERME MACHINE AND TOOL CO., INC.

12247 COYLE AVE. • DETROIT 27, MICH.

the wire and the jaws return ready for the next cut. All possibility of nicking or cutting the wire or fraying of wire ends is said to be eliminated. The handles are comfortably shaped and have a narrow span so as to fit easily into practically any hand.

Lightweight (10 oz.) and minimum finger pressure for operation are features that enable the Stripmaster to be used over long periods without fatigue. The tool is available in four models for handling all wire gauges from Nos. 22 to 8. A fifth model is designed especially for FM and TV down lead wire. Blades are in-



Ideal "Stripmaster" Wire Stripper

terchangeable on all models and can be taken off and replaced simply by removing two screws.

Universal Ioint

A universal joint available in 14 standard sizes from % to 4-inch hub diameter is now being produced under the trade name of "Dix" by the Lovejoy Flexible Coupling Co., 5007 W. Lake St., Chicago 44. Ill. According to the manufacturer, the joint is guaranteed to be concentric within 0.0005 inch and includes operating surfaces which are finished to such a degree of accuracy that pins cannot bind, backlash or inplay. All rivets are ground flush with the body of the joint to permit working inside tubing or in close quar-

Claimed to operate safely at maximum angles, the Dix Universal Joint is made of special alloy steel which is hardened. heat treated, and ground to specifications







Stop Breaking Presses ---Get a CRARY CALCULATOR

Designed to provide a quick and easy method of selecting mechanical and hydraulic presses for blanking, drawing and forming jobs. Gives correct speed for particular stroke and metal being worked. Developed by Len Crary, Staff Engineer, E. W. Bliss Co. Endorsed by National Tool and Die Mfg. Association, Pressed Metal Institute and adopted as standard by the press industry, Thousands in use. Calculator is 9½" square. Made of durable Vinylite. Complete with 70 page handbook of press data and leatherette case. Write for illustrated folder.

THE CALCULATOR CO., P. O. Box 4236, Phila. 44, Pa



"Dix" Universal Joint

exceeding Government requirements. On special order, the joint can be Magna-flux tested and

cadmium plated.
Large sizes can be
provided with Zerk
fittings as extra
equipment.

Forged Bits and Bars

The Maxwell Co., 325 Broadway, Bedford, Ohio, has announced the availability of a standard line of forged bits and boring bars, designed to fit any standard toolholder and available in an extensive range of sizes for use in boring, facing, recessing, and other similar operations. Fabricated of 18-4-1 high speed steel, the forged bits can be standardly furnished in a wide range of shank dimensions and maximum boring depths.

On special order, the bits can be supplied in shank sizes from % to 1 inch in increments of ½ inch. These specials can be furnished with a minimum boring capacity down to ¼ inch for the %-inch shank size and proportionately the

same for other shank sizes. In addition, the tools offer a selection of maximum depths for each of the various shank sizes, as well as minimum boring diameters.

The boring bars, which are made from alloy tool steel, are available in shank sizes from ½ to 1½ inches in increments of ¼ inch, and can be furnished with either straight or angular insertable bits. The standard cutter angle is 60 degrees; however, the tools are also available with a cutter angle of 45 degrees. Boring bar sizes are similar to those of the forged





on faster grinding

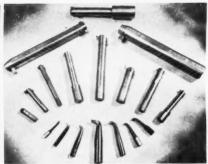
Keep the proper grinding wheel tool dressers handy. For fastest action on medium and coarse wheels use Desmond Huntington Dressers.



For extra service use Desmond's exclusive Hex Dressers (same cutters as Desmond Huntington). When one pair of bearing holes becomes worn loosen cap screw, pull out bearing blocks, and insert them with the pin in the next pair of bearings. Order Desmond Dressers from your industrial supply distributor, Desmond-Stephan Mfg. Co., Urbana, Ohio.



the only complete line of grinding wheel DRESSERS & CUTTERS



Maxwell Forged Bits and Bars

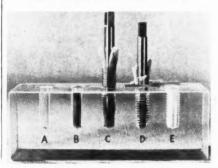
bits in that the bars can be furnished in a wide variety of minimum bores and maximum depths. Included in the boring bar line is an unusually short stub bar series which is recommended for the facing or boring of short holes and for applications where the bar must be short-coupled for performing line boring operations in which the toolholder itself enters the bore.

Tap-Cartridge for Blind Holes

The problem of efficiently tapping blind holes is said to be readily solved through the use of a hard plastic extrudable cartridge now being offered by The Tap-Cartridge Co., 4208 Airport Rd., Cincinnati 26, Ohio. The cartridge is available in a wide variety of types, diameters, and lengths.

Referring to the accompanying illustration, to tap a blind hole that has been

Illustration Showing Manner in which Blind Hole is Tapped Using Tap-Cartridge



drilled or drilled and reamed, as shown in A, a Tap-Cartridge of the proper type and size is dropped into the hole, as shown in B. The tap is then introduced into the cartridge, the extruding cartridge picking up all chips as they are cut and forcing them to flow with the material up and out of the hole, as shown at C. D shows the tap at the very bottom of the hole, all chips except those from the last few threads having been extruded from the hole. These last chips are in that portion of the Tap-Cartridge still in the flutes of the tap, are thus immobilized against independent movement, and are withdrawn with the tap. The completed tapped hole is shown at E.

High Speed Grinding Attachment

For use in connection with its Nos. 2 and 4 flexible shaft machines, the R. G. Haskins Co., 2651 W. Harrison St., Chicago 12, Ill., has developed a lightweight yet sturdily built high speed grinding attachment designed for continuous service. The attachment is said to increase the speed delivered by the Nos. 2 and 4 machines at a rate of 2 to 1 (No. 2

chines to 22,000 r.p.m. and No. 4 machines to 16,000 r.p.m.).

The Haskins High Speed Grinding At-



Haskins High-Speed Grinding Attachment

tachment is recommended for surface, as well as deep cavity (up to 5 inches deep), grinding and polishing operations.

NEW GRAHAM CENTERING VISE

With left and right hand screw, both jaws move toward center, centering work regardless of size variations. This gives double-fast action. Can be used with interchangeable V jaws. Handle fits either end.

MULTI-PURPOSE SWIVEL BASE VISE

Has exclusive ADJUSTABLE ZERO POINTER to assure coincidence with zero on base. Complete 360° rotation. Positive 2-point lock in any position. Screw never protrudes under work, cannot be drilled into. Usable with special jaws and jig attachments described below. Removable from base for use plain.

JIG ATTACHMENT VISE

Usable plain. Also drilled and tapped for stops, guides, bushing plates and other attachments making it a Multi-purpose jig or fixture serving many repeat-operation needs saving the cost of making special devices.

ALSC "ADJUSTANGLE-KNURL TOOL FITTING TURRET

Request Illustrated Price Bulletin 44
GRAHAM MFG. CO., EAST GREENWICH, R. I.

It is said to provide an excellent means for grinding and polishing welds in hardto-get-at places since it permits the sensitive operation of small rubber and resinoid bond grinding wheels up to 2% inches in diameter.

The molded round belt of the attachment is amply guarded and is arranged to slip if the wheel should snag, thereby protecting the wheel and the operator.

The belt guard also affords a convenient hand-hold for sensitive grinding with

minimum pressure.

Power Gaging Handle

The fast inspection of internally threaded parts with minimum operator fatigue is claimed to be obtainable with a power driven gaging handle announced by The Taft-Peirce Manufacturing Co., Woonsocket, R. I. With the tool, manual rotation of a gage is said to be eliminated. Instead, the gaging handle mechanically screws the gage into and out of the work at a speed of 4 revolutions per second. Immediate reversal or automatic disengagment of the drive is obtained by a slight change in the applied pressure. Designed for operation on 110 volts,



Taft-Peirce Power Gaging Handle

a.c., the Taft-Peirce Power Gaging Handle is available for any of the following A.G.D. gage blanks: No. 4, No. 5, No. 6, No. 8, No. 10, No. 12, 1/4 inch, 1/8 inch, 3/8 inch, 1/8 inch, and 1/2 inch.

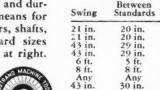
SELECT THE BEST ... Balancing Tool for Your Work from Sundstrand's Complete Line

Here's a complete line of Balancing Tools which will save their cost quickly on balancing or truing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts. fly wheels, pulleys, etc. The standard sizes available are shown in capacity chart at right.



FREE ADDITIONAL

You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin No. 585.





SUNDSTRAND

CAPACITI

MACHINE TOOL COMPANY 2539 Eleventh St. Rockford, Ill., U.S.A

Weight

Capacity

12 lbs.

800 lbs.

800 lbs.

2,000 lbs.

5,000 lbs.

10,000 lbs.

24,000 lbs.

800 lbs.

Profile-Measuring Microscope

A profile-measuring microscope for high precision measuring and the control of profiles on the basis of enlarged drawings is now available from the Hauser Machine Tool Corp., Manhasset, N. Y. Designated as the P219, the unit effects a comparison of the enlarged projected image with a correspondingly enlarged outline drawing of the particular tool, thread, gage, and so on, 6, 10, 20, 30 or 50X full size.

Uses for the microscope include the



Hauser Profile-Measuring Microscope P219

checking of screw threads for core diameters, pitch, angle of inclination, and form of thread; measuring the cutting angles of tools, gages, templates, and edges of cutting tools; coordinate measurements of various workpieces, gages, and so on; and checking the profiles of diverse workpieces, tools, gages, and so on, by comparing with enlarged drawings to scale. Two special tool carriers are provided for objects that cannot be placed directly on the table. The measuring table is $5\frac{1}{2} \times 8$ inches with a rotating glass center. Largest diameter possible of measurement with the microscope is 3-17/32 inches.



MATHIAS KLEIN & SONS, Chicago, selected cutting fluids for machining high carbon vanadium steel plier forgings by competitive tests. With D. A. Stuart's Solvol, tool life was more than double that secured with the best of several products tested.

A 20 to 1 dilution of Solvol permits side broaching 28,000 pieces per grind. Drilling, reaming and countersinking production is 650 pieces per hour with a 30 to 1 dilution.

The results secured with Solvol show why in buying cutting fluids it is wise economy to figure production costs rather than cutting fluid price. Write for booklet.



27411/2 South Troy Street, Chicago 23, III.

Ceramic Surface Plate

A ceramic surface plate designed for use in toolrooms and inspection departments where precision setups and checking measurements of unusually high accuracy are required is announced by the Norton Co., Worcester 6, Mass. According to the manufacturer, the plate affords extreme wear resistance, a pre-cisely flat surface guaranteed to be within 0.0001 inch, and a continuously smooth surface finish.

Made of one of the hardest substances known, the Norton Ceramic Surface



Norton Ceramic Surface Plate

ACTING CLAMPS

Have push-pull action for instant clamping. Safety clutch and ballbearing foot prevent frame damage. The perfect clamp for welding-spatter can't stick to smooth pressure rod. Write for informa-

RICHARD'S INDUSTRIES INC. 24 Leonard St., N. W., Grand Rapids 5, Mich. Plate will not warp or deform, offer expansion troubles, or deflect under load, it is claimed. Its smooth semi-glossy surface is neither slippery nor sticky and is ideal for blueing, the manufacturer states. In addition, the plate it is reported, is non-magnetic, will not sweat or corrode under any atmospheric condition, and may be easily cleaned with soap powder and water.

The Norton Ceramic Surface Plate is furnished in Standard sizes from 5 to 24 inches.

Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS

Simply insert in holes, invert, strike sharply and you have centers and drill cir-cles perfectly located. Re-



duce time and eliminate spoilage of other methods. 8 sizes, from 3/4" to 3/4" U.S.S. Inexpensive — Last for years.

Write for Circular

NIELSEN TOOL & DIE COMPANY

1960 W. Eleven Mile Rd. Berkley, Mich.

Adjustable Carbide-Tipped Reamer

An adjustable carbide-tipped reamer developed by the Wendt-Sonis Co., Hannibal, Mo., features a replaceable cutting blade with a single piece of carbide, heavily backed with high speed steel, extending the full length of the blade. Cut-

MIGHTY MIDGET" RADIUS DRESSER



PUT ONE ON EVERY SURFACE GRINDER

Less Diamond

Hardened shaft - Bearing adjustable for wear. Diamond always perfectly clamped in place.

10" Wheel size for DoALL and NORTON Grinders-\$35.00 Less Diamond.

ORDER DIRECT on our 10 day money back guarantee.

SPERMAN METAL SPECIALTIES, Dept. M, 2199 E. 21st St., Brooklyn 29, N. Y.



Wendt-Sonis Adjustable Carbide-Tipped Reamer

ting edges are diamond lapped, and threads are precision ground to permit

close blade adjustment. Maximum expansion allows for a large number of regrinds, and a special safety lock nut permits easy replacement and positive locking of the inserted blade.

The Wendt-Sonis Adjustable Carbide-Tipped Reamer is available in sizes from % to 4 inches with straight or taper shanks or in shell types.

Shop Model

Gear Gage

gear gage designed

especially for shop

use has been added to the line of gear

testing equipment and precision tools

manufactured by

the George Scherr

Co., Inc., 198-A Lafayette St., New York 12, N. Y. The

Scherr Shop Model

Gear Gage, which can be readily car-

ried in a tool box or in the pocket, includes teeth which are especially pro-

tected against

damage and has 16

blades of the fol-

A new model

lowing diametrical pitches; 4, 5, 6, 8, 10, 12, 14, 16, 20, 24, 28, 32, 36, 40, 48 and 64 in 14½-degree pressure angles. The teeth are of the correct involute shape, machined with the aid of special fixtures by the Fellows gear-shaper generating method. The segment blanks of each pitch are first turned in fixtures to conform to the full diameter in accordance with the number of teeth for the full circle.

Designed to provide a quick means for checking gears, as illustrated herewith, the Scherr Shop Model Gear Gage is said to be highly practical for designers, esti-

TAPS WON'T BREAK with the JAY-DEE Tapping Attachment Jay-Dee employs an entirely new clutch principle, designed

Jay-Dee employs an entirely new clutch principle, designed specifically to eliminate tap breakage. Instead of using coiled springs to provide driving pressure, it has a resilient material . . . 150 times more effective than steel . . . to produce safe torques at all times. This new attachment is simple as well as safe; definite torque settings for given tap sizes and taps can be changed in a few seconds without wrenches.

Can be used for horizontal or vertical tapping, stud driving, blind or through holes—on all reversible machines.

LARGE TAP

K-1 unit handles taps ½"-13¼" USS, a range normally requiring three attachments. Other units also available.

Guaranteed for 12 Months!



Bulletin with full details. Yours for the asking.



ARTUS PLASTIC SHIM



AND FEELER GAUGE STOCK



The COLOR tells the THICKNESS

Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting. 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors-12 thicknesses (.001-.030). Bound together. \$4.45.

Order today. Immediate delivery.

INDUSTRIAL PRODUCTS SUPPLIERS 434 Broadway, Dept. M, New York 13, N. Y.

HAND SPRING WINDER

NO LATHE NECESSARY



53 PARK PLACE

- 1. Ideal for tool room & maintenance shop
- 2. Easily operated by hand
- 3. No lathe necessary 4. Mandrel capacity to 11/2"

 5. Wire capacity up to .229" diameter
- 6. Pitch capacity up to
- 7. Clamps in your bench

4 SIZES Priced from \$15 to \$35

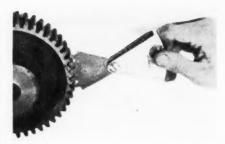
DELIVERY ONE WEEK

Write for Complete Catalog

MONTGOMERY

Machine Tool Accessories

N. Y. C. 7, N. Y.



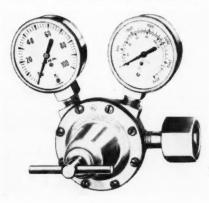
Scherr Shop Model Gear Gage in Use

mators, and gear users in visualizing the size and strength of teeth or checking the finished gear for diametrical pitch.

Single-Stage Welding Regulator

A single-stage welding regulator for oxygen and acetylene is now in production by the C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo. Of the yoke type for maximum safety, the regulator is said to assure positive delivery of oxygen and acetylene at correct pressures without creep and to hold the secondary pressure while the tank pressure falls. A ball-pivoting lower spring rest is claimed to assure permanently fric-tion-free operation. Other features include O-rings between the yoke and diaphragm and between the body and bonnet to seal and cushion the diaphragm for maximum performance and easy maintenance. A special design guides the

Norgren Single-Stage Welding Regulator



jet accurately to a disc so that it always seats at exactly the same location for a

positive seat.

The Norgren Welding Regulator, which is listed by Underwriters' Laboratories, Inc., is supplied complete with primary and secondary pressure gages and standard tank connection. The regulator can be easily and completely dismantled with only a screw driver and crescent wrench without removal from the cylinder.

Cunningham "Luminum-Line" Marking Holder

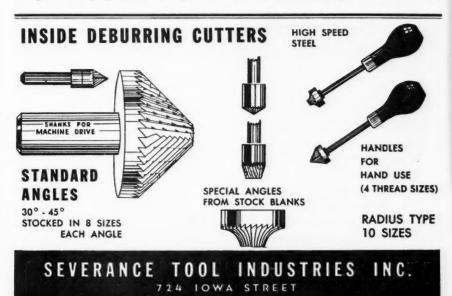
Marking Holder

Known as the "Luminum-Line," a lightweight streamline holder for marking plate and pipe has been developed by the M. E. Cunningham Co., 158 E. Carson St., Pittsburgh 8, Pa. Adaptable to all heavy-duty marking requirements, the holder, it is claimed, is easy to operate due to its unusually lightweight and yet affords a high degree of ruggedness, dependability, and long-service life.

The steel stamp holder is cast from a tough grade of aluminum alloy and incorporates friction retaining springs for the quick changing of steel stamps. The

holder is designed with a flat bottom and replaceable metal "feet" which enable it to be carried along hot steel plates without damaging the stamps. Special V-shaped runners are furnished with the holder to permit positive positioning on round objects. The top side of the holder has rounded ribs around all stamp holes to resist any foul hammer blows.

The Cunningham Luminum-Line Marking Holder is available in any size or style and for any size, number, or combination of stamps.



SAGINAW, . MICHIGAN

Notching and Punching Tools

Two hand tools for sheet metal men, a dovetail notcher designated as the Whitney-Jensen No. 121 and a snap lock punch identified as the Whitney-Jensen No. 131, are being introduced by the Whitney Metal Tool Co., 110 Forbes St., Rockford, Ill. Intended for use in dovetailing operations when installing collars, stubs, Y-joints, and the like, the notcher is said to cut clean dovetails in mild steel up to 20 gauge and to fold tabs down square in one operation. Spring-return jaws provide for quick release and easy handling on successive cuts. The tool is



Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries.

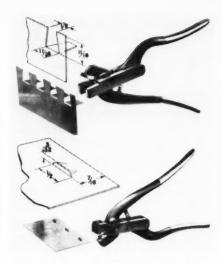
BLOOMFIELD TOOL CORP.

37 FARRAND ST. BLOOMFIELD, N. J.



Aero Spiral flute HSS Co-sinks end chatter, cut clean and accurately. Stocked in 60, 82, 90, 100 degree included angle, $\frac{1}{2}$, $\frac{1}{2}$ "diameter, with $\frac{1}{2}$ " shank and $\frac{3}{4}$ ", and 1" dia. with $\frac{1}{2}$ " shank. If not available from your Mill Supply dealer order direct.

AERO TOOL COMPANY
6930 Avalon Bd., Los Angeles 3, Calif.



Whitney-Jensen No. 121 Dovetail Notcher (Above) and No. 131 Snap-Lock Punch

8½ inches long and weighs one pound. The No. 131 snap-lock punch is capable of producing uniform ears which snap under and lock firmly on the seamed edge of a joining piece. Particularly useful in duct and furnace work and for repairing old sheet metal installations, the punch features forged smooth-finished handles, spring-return jaws for easy operation, and a capacity of up to 20 gauge mild steel. It measures 8½ inches long and weighs 1 pound.

"Chrome Clad" Micrometer

The Lufkin Rule Co., Saginaw, Mich., has announced that all Lufkin micrometers will hereafter have a "chrome clad"

LE COUNT'S EXPANDING MANDRELS



W. G. LE COUNT TOOL WORKS
SOUTH NORWALK, CONNECTICUT, U.S.A.

 For use on Lathes, Grinders or Milling Machines for increased production and also a Time Saver in the Tool Room. Qwik action no arbor press required.

Designed for Accuracy, Strength and Long Service. No tragile parts to wear out. The three blades used in construction correct any inaccuracy of the bore. A set of 5 will take bores from \(\frac{3}{2} \) inch to 4 inch inclusive. Extra keys can be furnished on No. 5 Mandrel for bores to 7 inches.

SINCE 1847

satin finish which possesses a non-glare quality that is said to make reading easy in bright or poor light. Markings are claimed to stand out sharp and bold



Lufkin "Chrome Clad" Micrometer

against the satin finish which is also highly rust and wear resistant.

To ensure maximum measuring accuracy, the anvil and spindle ends of each micrometer have a micro-lapped mirrorlike finish. The one-piece spindle has hardened and ground threads to assure smooth action and long life. Additional features include a cutaway frame to facilitate entrance of the micrometer into

hard-to-get-at places; rapid reading (each thousandth graduation on the thimble numbered); and easy method of adjustment whereby reading lines always maintain their original position, directly in the line of vision. The chrome clad frame also includes decimal equivalents of 8ths, 16ths, 32nds, and 64ths prominently marked for easy reading.

Solid Adjustable Die Head

A solid adjustable die head designed for use on automatic machines for threading street ells and similar cast iron fittings where clearances are limited between the die head and the machine is announced by the Landis Machine Co., Waynesboro, Pa. The diameter of the die head is 3% inches and, to provide further clearance, the chaser holders are beveled off on a 45-degree angle.

The die head consists of a head body with chaser holders mounted on the face of the body. Individual adjustment is provided for each chaser holder. Although the same head body can be used, a different set of chaser holders is required for each diameter.

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READY FOR USE WITHOUT FUMBLING OR WASTE...

It's still in the package, still protected, still rolled ... but it's ready for instant use! Just pull the required amount of either brass or steel out of the package slot and snip it off. You're ready for the job!

No fumbling or spoilage with long strips or sheets of easily damaged thin gauge stock. No

Gauges Available in Dispensing Cartons

6" x 100" rolls
.001 .003 .006 .009
.0015 .004 .007 .010

008

.012

005

002

Heavier gauges, .015, .020, .025 and .032", are packed in envelopes containing four flat strips, each 6" x 25". LAMINUM (Reg. U. S. Pat. Off.), the laminated stock that simply p-e-el-s off to adjust the gauge, is sold in strips, 2" x 9".

problem of protecting your supply between jobs. Gauge plainly marked on container...no miking.



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Original Electric Etcher. Thousands in Daily Use

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P. O. Box 191

Tenafly, N. J.

WOODRUFF = KEYS



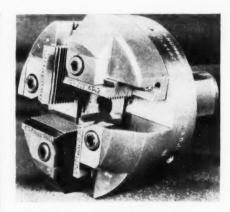
We manufacture a complete line of Woodruff keys in all standard sizes. These sizes range from as small as ½" x 1/16" to keys as large as 3%" x ¾". All keys are carefully checked for burrs, slivers, etc. before being shipped to you. Only the finished tested keys are permitted to leave our plants.

We carry a complete stock of high quality, dependable keys. Send for our catalog for complete information on Woodruff keys, taper pins, machine keys, and machine

STANDARD STEEL SPECIALTY COMPANY

REAVER FALLS

PENNSYLVANIA



Landis Solid Adjustable Die Head

The head shown is driven by means of the square section of the shank and is centered by a cylindrical portion. It is held in position by means of a draw rod through the spindle. The head body is made of air hardened steel. The chaser holders are made of alloy steel and heat treated to ensure strength and long life.

Ejector Tool Insert Grinding Fixture

The Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich., is now offering a fixture for sharpening and grinding chip

Ejector Tool Insert Grinding Fixture



breakers on its ejector tool inserts. Said to provide ample clearance for grinding any insert with either a flat or dished chip breaker, the fixture is ruggedly constructed and designed for ready duplication of established grinds. Two calibrated setting dials provide for accurate adjustment in any position, and cam index plates facilitate the grinding of rectangular, square, and triangular inserts. The stop is lifted out of position for grinding round inserts.

The spindle of the ejector tool insert grinding fixture is of the preloaded

ball bearing type and is ground after assembly in the fixture to assure a ccurate alignment. Collets are available for all type inserts in a range of standard sizes.

Steel Chaser Clip

A spring steel clip which is designed to provide a permanent and convenient means for holding chasers together in a set before and after using is an-The nounced by Geometric Tool Co., Blake and Valley Sts., New Haven 15, Conn. According to the manufacturer, the Geometric Chaser Clip prevents the loss of individual chasers, avoids mixing of one set of chasers with other sets, protects chaser teeth from damage, provides for convenient chaser handling and simplifies the issue of chasers from a tool crib.

The Geometric

Chaser Clip is furnished as standard equipment with the company's "Supermetric" ground thread chasers which are made with mirror finish bearing surfaces in keyway and lug slots, as well as with highly finished cutting surfaces and chamfers.



Geometric Chaser Clip



Input Controller

The ThermoElectric Manufacturing Co., 488 W. Locust St., Dubuque, Iowa, announces a stepless input controller for use on regulating temperatures of electrically heated furnaces, ovens, mantels, tanks, pots, and so on. Designated as the "Temcometer" Model 600, the instrument is intended for use where permanent through-panel mounting is desired.

The Temcometer Model 600 is 31/2 inches in diameter and extends 4 inches behind the mounting panel. The instrument dial is graduated in per cent time "on," and stepless regulation between 5 and 100 per cent is provided. Once the



"Temcometer" Model 600 Input Controller

control knob is properly positioned to

produce the desired temperature in the connected equipment, the temperature is said to be maintained automatically regardless of wide fluctuations in line voltage. For loads over 6 amperes, 115 volts, or 3 amperes, 230 volts, the instrument is connected to a relay of proper capacity for the connected load.



Available in 12 different shapes, a carbide cutter to be known as the "Carbo-Mill" is now being introduced by Severance Tool Industries Inc., 724 Iowa St., Saginaw, Mich. The cutter has a 1/4-inch







diameter shank and is made of solid carbide in one piece, the cutting head and shank being integral.

The Carbo-Mill is claimed to be ideal for the production deburring and machin-

high speeds, thus permitting delicate precise work in close exacting operations and on the most intricate patterns. If necessary, the tool can be economically reground a number of times.



Severance "Carbo-Mills"

ing of parts made from materials that are abrasive or tough or have a hardness ranging up to 60 Rockwell C. The tool is said to be equally useful to maintenance men and to tooling departments in the production of dies, molds, and metal patterns. Being made of a single piece of carbide, the tool, according to the manufacturer, provides for ideal balance at

Carbide-Tipped End Mills and Holders

The Lovejoy Tool Co., Inc., Springfield, Vt., announces a complete line of carbide-tipped end mills and suitable holders. A positive locking device is used to hold each mill immovably in its holder while allowing endwise adjustment and quick change of cutters. An alternate adjusting shoe adapts the cutters to standard setscrew type holders.

Two-flute end mills are available in diameters from ½ to 1 inch and four-flute mills from ¾ to 2 inches. All end mills have 1-inch diameter shanks to assure complete interchangeability, and are available for cutting cast iron or steel. One-flute end mills, 1 inch in diameter, are available for use where economy and ease of sharpening are primary considerations.

Holders are available with Nos. 4, 5.

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MUMMERT-DIXON SWING FRAME GRINDERS

Sizes 12", 14", 16", 18", 20" and 24" wheels.



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MUMMERT-DIXON CO.
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Lovejoy Carbide-Tipped End Mill and Holder

6 and 7 Morse tapers, Nos. 7, 8 and 9 B&S tapers, and Nos. 40 and 50 N.M.T.B. adapters.

DIVIDING HEADS



3 SIZES - 4 MODELS - 6" to 12"
TROYKE MFG. CO.
4422 APPLETON ST. CINCINNATI 9, OHIO

Adjustable Crowfoot Attachment

An adjustable crowfoot attachment which is claimed to combine the flexibility of the detachable socket system with all the advantages of the open-end adjustable wrench is announced by J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y. When used with the numerous handles and parts available, the attachment presents a wide variety of combinations for performing nut turning jobs.

The Williams Adjustable Crowfoot Attachment is made from selected alloy steel into square drive sizes of % and ½ inch with capacities of ¾ and ½ inch respectively. Square shoulders on the body portion of the sliding jaw are said to provide for maximum and positive bearing against working stresses.

KEYWAYS A Foot A MinuteWith A MASTER CONVERTER



Capacity: 1 Cu. In. Metal Per Min. Per H.P.

BASIC MILLER and 7 Interchangeable HEADS THE MASTER LATHE CONVERTER

The world's most versatile auxiliary machine tool. Result of 14 years of designing, engineering and building multi-purpose milling and grinding attachments. Also does internal keyseating, drilling, reaming, boring, thread milling and hundreds of other metal working jobs. Maximum Performance, Minimum Cost. Write for Descriptive Literature.

MASTER MANUFACTURING CO.
1302 East Avenue "A" Hutchinson, Kan.

Williams Adjustable Crowfoot Attachments





Dorman Model 2-B Tapping Attachment

Tapping Attachment

The Dorman Machine Tool Works. 36 S. MacQuesten Pkwy., Mt. Ver-non, N. Y., an-nounces a highspeed automatic reverse tapping attachment of full ball bearing construction. Identified as the Model 2-B, the attachment, which measures $3\frac{1}{2}$ x $5\frac{1}{2}$ x 9 inches in size weighs 11 lb., is durably made for strength and has a capacity for hand or machine

screw taps from % to % inch and pipe taps from ¼ to ½ inch both in steel. The attachment includes a clutch built

The attachment includes a clutch built into hardened drive and reverse gears, and a full floating chuck jaw to prevent tap breakage due to misalignment of tap and hole.

Hydraulic Sequence Valve

The Gerotor May Corp., Dept. MMS, Baltimore 3, Md., has added a sequence valve, designated as the Gerotor Model 8822. to its line of oil hydraulic valves. The valve is arranged to prevent flow into a branch circuit until the pressureinthe main circuit has reached a predetermined amount.

Features of the Model 8822 valve include a hydraulically balanced piston with extra large bearing surface: spring guide: C CHOTON

Gerotor Model 8822 Hydraulic Sequence Valve

face; spring guide; hardened, ground and lapped plunger; single diameter bore; piston stop; and large diameter plunger. Direct operated by the pressure in the "in" port, the

● Make the most of your tool maker's time by reducing set-up time on Jig borers, milling machines, slotters, planers, boring mills, punch presses, etc.



Northwestern T nut and stud sets eliminate the time spent looking for correct length studs for each set-up. They are available in sets to fit all machinery.



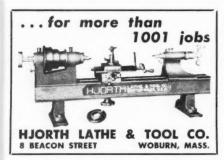
Northwestern step block sets eliminate time spent looking for hit-or-miss temporary blocks and shims for each set up. Write today for detailed bulletin and selection chart showing various types and size of stud sets which we carry.

NORTHWESTERN TOOL & ENGINEERING CO.

119 HOLLIER AVENUE DAYTON 3, OHIO valve is available in two pressure ranges of 50 to 500 p.s.i. and 500 to 1.500 p.s.i., with adjustment from minimum and maximum in each range. The seven valve sizes offered range from $\frac{1}{4}$ to $\frac{1}{2}$ inches.

Tilting Sheet Feeding Attachment

A tilting sheet feeding attachment for use with its elevating table has been developed by Montgomery & Co., Inc., 53 Park Pl., New York 7, N. Y. The attachment is made of steel throughout and has

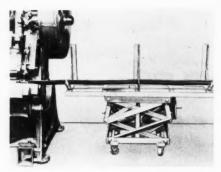


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Multiple Spindle Drilling and Tapping Machines • Automatic Drilling and Tapping Units • Multiple Spindle Attachable Drill Heads • Hot and Cold Swaging Machines • Hammering Machines • Tools, Jigs and Fixtures • Contract Work • Special Machinery.

LANGELIER MANUFACTURING CO.

Providence 7, Rhode Island



Tilting Sheet Feeding Attachment Used in Combination with Montgomery Elevating Table

eight angular adjustments up to 45 degrees.

Specifications of the rack are as follows: width, 20 inches; maximum length, 72 inches; capacity, 1,000 lb.; weight, 100 lb., length of brackets, 8 inches.

Hardness Test Blocks

Clark Instrument, Inc., 10200 Ford Rd., Dearborn, Mich., announces a series of precision test blocks for use with any Rockwell type hardness tester. The test blocks are available in hardness grades for all Rockwell scales, and the limits covered by each block are clearly stamped on the edge.

Also available is a deluxe master diamond checking set which includes a gold plated diamond penetrator and two test blocks—one for the higher and one for the lower range of hardness values. The diamond penetrator is intended for use only when checking the owner's machine, thus assuring accurate test readings. The

MILWAUKEE PRECISION EQUIPMENT

Surface Plates, Angles, Parallels, and Straight Edges are all backed by over twenty years of practical experience. You pay no more for this added assurance of accuracy and durability.

J. C. BUSCH COMPANY

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126 E. Pittsburgh Ave.

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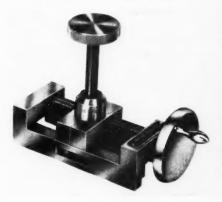
Clark Master Diamond Checking Set

set is furnished in an upholstered leather-finished case that protects the penetrator and test blocks when not in use.

Wheel Dresser

Identified as the Model A, a wheel dressing device for surface grinders which is designed to dress grinding wheels from 1% to 4½ inches wide has been placed on the market by the Matco Tool Co., 2834 W. Lake St., Chicago 12. Ill. With the device, the operator is able to dress a wheel while grinding, thus eliminating the necessity of stopping the machine, removing the work from the

Matco Model A Wheel Dresser





chuck, and lowering and raising the wheel head.

Said to dress absolutely parallel with the chuck on the surface grinder, the Matco Model A Wheel Dresser can be easily installed and is constructed for long service life.

High Temperature Nut

A nut for temperatures up to plus 1,200 deg. F. is announced by the Elastic Stop

Nut Corporation of America, 2330 Vauxhall Rd., Union, N. J. The nut is selflocking and is said to provide permanent protection against vibration, impact, and stress reversal in both fully seated and positioned settings.

For high temperature applications, the nut is available in a Z-1200 Series which can be subjected to a temperature of plus 1,200 deg. F. and still retain the repeated reuse characteristics of standard Elastic Stop Nuts. This series is claimed to be particularly suited for use on exhaust manifold systems, aviation gas turbine

tail cones, and other equipment where temperatures tend to create strength and seizure problems.

For medium to temperature applications, the nut is available in a ZE Series which is said to withstand temperatures up to plus 550 deg. F. without seizing the bolt or galling the threads even after repeated exposure to such tempertures. In addition, the ZE Series nut is claimed to maintain its locking torque through reuse.

The elastic deflection feature built into the locking beams of both the ZE and Z-1200 Series enables the nuts to be reused interchangeably. Both the ZE and Z-1200 Series are available in hex and anchor styles. The ZE Series is offered in five thread sizes ranging from 10/32 to the fractional size of %-24 in the National Fine series. with 8/32 coarse also available in the hex style. In the Z-1200 Series the hex style nut





is supplied in four thread sizes ranging from 10/32 to the fractional size of %-24, while the anchor style nut of the Z-1200 Series is available in three sizes of 10/32, 1/4-28, and fe-24.

Z-1200 Nut

erally activated by the same power which moves the machine cylinder. A "pressure-booster" modification is available for use in those applications where the cylinder pressure is less than the water pressure.

ical motivation.

The valve is gen-



"Water-Saver" Valve

"Water-Saver" Valve

A "water-saver" valve for controlling coolant flow on welders and machine tools has been introduced by the Ross Operating Valve Co., 120 E. Golden Gate Ave., Dept. 157, Detroit 3, Mich. The valve is a straight-way or shut off unit normally open or closed to the water supply. It allows the coolant to flow when needed but automatically turns it off between required periods. A time delay adjustment is set for maintaining the coolant flow for a period of 0 to 21/4 minutes after the machine cycle.

Operation of the valve is entirely automatic, requiring no electrical or mechan-

1/2-Inch Electric Drill

A compact lightweight general purpose ½-inch capacity electric drill identified as the No. 112 has been announced by Stanley Electric Tools, New Britain, Conn. An outstanding feature of the tool is the chuck cylinder offset which permits the operator to drill in close quarters without removing the pipe or spade handle of the tool.

Additional features of the Stanley No. 112 Drill include alloy steel gears, thrust

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From 1 ounce to several pounds. Complete stock of more than 50 chemicals, all TESTED for strength and purity. Includes Copper, Nickel, Silver, Gold plating concentrates and all other chemicals used in Electroplating.



Includes the Dipper, Pitcher and Funnel.

duce fine surfaces and bright plating.

Acid Proof Utensils Felt Polishing Wheels Buffing Cakes Covered with Rubber. Designed to give long Includes Emery for Can't crack or chip. polishing life. Procoarse polishing, Tripoli for cutting, Red Rouge for brillancy.

See Catalog for Complete Listing

WARNER ELECTRIC COMPANY



TANK
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Finest quality made. Post-war engineered for lifetime of use. Guaranteed capacities with tested ratings. See Catalog for descriptions and prices. FREE—use coupon.

400

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CO., Inc. 198-A Lefayette St. New York 12, N.Y.

for magnetic-chucks

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SCHULTZ & ANDERSON DOWEL PINS



Immediate Delivery!

Standard Size Dowel Pins from 1/8" to 1" diameter and from 3/8" to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

> Dealer inquiries invited.



TZ & ANDERSON

NEWARK 5, N. J

ball bearing on the spindle, strong aluminum alloy housing, automatic release safety switch with locking device, and



Stanley No. 112 1/2-Inch Electric Drill

Jacobs three-jaw chuck. A bench stand designated as the No. 524 is available in which the tool can be mounted to provide a convenient drill press.

Drill and Countersink Set

The accompanying illustration shows a drill and countersink set which is now being offered by Keo Cutters, 19326 Woodward, Detroit 3, Mich. The set consists of seven combination drills and countersinks with outside diameters ranging from 1/8 to 176 inch.

Made of 18-4-1 high speed steel with carefully ground flutes that provide for adequate chip removal, the tools are

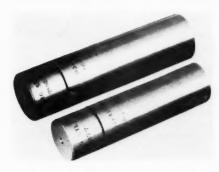


Keo Drill and Countersink Set

packed in an attractively finished hardwood box having a separate compartment for each drill, as well as a screw cap.

Revolving Stops

The Boyar-Schultz Corp., 2120 Walnut St., Chicago 12, Ill., announces the addition to its revolving stop line of two new



Boyar-Schultz No. 4RS and No. 5RS Revolving Stops

sizes for use on turret lathes and larger type screw machines. The new sizes are identified as the No. 4RS (1½-inch shank) and No. 5RS (1¾-inch shank).

Designed to maintain correct feed-out length under all conditions, the stops are precision made of high quality materials and hardened to withstand repeated impacts. The internal ball race of each stop is enclosed to prevent the entrance of chips and foreign material.

Disc Sanders

The Bradford Machine Tool Co., Cincinnati 4, Ohio, has added a 7-inch heavy duty and a 9-inch standard duty portable electric disc sander, designated as the Models 207 and 209 respectively, to its line of "Metalmaster" tools. Each model is designed with a vertical-type spindle construction which permits easy and fast operation and enables the user to reach into difficult places encountered in sanding and finishing auto bodies, machinery, and so on.

The Metalmaster Models 207 and 200 Disc Sanders are constructed to provide for maximum operating efficiency. The rear grip of each tool is positioned to maintain correct balance in any working position. The side handle is removable and can be attached to either the right or left-hand side to suit the operator. The

LET ENCO'S VERSATILITY CUT YOUR COSTS



Photo No. 1
No." square tool bit mounted in blade!
412-5 turret used for facing cut.



Photo No. 2

The same tool used for broadface furning merely by indexing furcetone position or 10



Photo No. 3

The above photos illustrate the flexibility of 12 position indexing whereby each tool may be used in three different working positions.

SPECIFICATIONS OF A FEW OF MANY ENCO TURRETS

Model No.	HD-2	6-5	41/2-R	41/2-5	31/2-R	31/2-5
Suggested Lathe Size	16" to 24"	14" to 20"	15" to 19"	13" to 16"	12" to 15"	10" to 13"
Tool Block Size	6½" sq.	6" sq.	4½" sq.	4½" sq.	3½" sq.	3½" sq.
Solid Tool Capacity	1 1/2 ' '	11/4"	1"	3/4**	7/8**	1/2**
Price	\$138.50	103.50	66.50	53.50	46.00	36.75

WRITE FOR CATALOGUE No. 48 WHICH SHOWS TYPICAL APPLICATION PHOTOS OF MANY OF ENCO'S 35 MODELS ON ACTUAL JOBS.

Also Mfrs. of Enco Hexturret Bed Turrets and Tailstock Turrets for 9" to 18" Lathes. ENCO MANUFACTURING COMPANY, Dept. 169, 4524 Fullerton Ave., Chicago 39, III.

trigger type switch has a positive lock for continuous operation. A spindle lock is provided for quick and easy changing

of pads.

Each model is powered with a universal 110-volt a.c./d.c. motor, which drives the tool at a no-load speed of 5,200 r.p.m. Heavy duty ball bearings are used throughout. All gears are made of alloy steel, hardened, helical cut and amply lubricated. A strong, lightweight aluminum housing completely encloses the tool. The net weight of the Model 207 is 10 lb.; the Model 209 11 lb. Equipment furnished includes 15 feet of rubber-cov-



Bradford "Metalmaster" Disc Sander

GRAY TURRET HEAD METAL CUTTER OR NIBBLER

N.A.M. Ploneer Award Given to Gray

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet & Plate Shops.

GRAY MACHINE CO.

Box 596, Philadelphia, Pa.

ered three-conductor cable with plug and cable strain reliever; one backing pad; and three sanding discs.

Precision Feed Controller

The National Pneumatic Co., Industrial Division. Rahway, N. J., is now producing an auxiliary control for feed mechanisms, designated as the N.P. "Power-Check." The device, when nose-mounted through a bracket attached to the moving element of any feeding mechanism, may be employed to automatically retard speed and ease pressure at any or all points of feed travel.

When applied to a pneumatic or manual drill press feed, the Power-Check can be adjusted to retard the drill during the entire operation or to ease the drill through at only the break-through point so as to eliminate drill breakage. In mil-





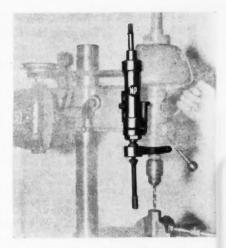
LYON-Raymond Corporation

798 Madison St., Greene, N. Y.

ling and grinding operations, the Power-Check can be utilized to provide a precision-controlled uniform speed to eliminate destructive chatter and backlash that might cause tool breakage.

The N.P. Power-Check Precision Feed Controller consists essentially of a hydraulic (oil) cylinder and an operating rod on which simple fittings can be quickly spaced and preadjusted-during the setting up of a machine-to provide a retarding pull up to 1,000 lb. (with safety factor of another 1,000 lb.) at the desired "control" points of feed travel. (Heavy duty units are also obtainable.) Strength of pull is readily regulated by an external setting.

According to the manufacturer, the Power-Check is completely self-contained, and the oil-filled cylinder is leakproof. The operating rod can be attached directly to a drill press spindle bracket; to the air cylinder piston rod of a pneumatic drill press; a bracket on the feed table of a milling machine or grinder, or air cylinder piston rod if the table is air operated, and so on. Movement of the feed mechanism actuates the Power-Check, the return stroke of which is always unrestricted, it is claimed. The Power-Check is standardly available with



N. P. "Power-Check" Precision Feed Controller Applied to Manually Operated Drill Press

a 2. 3. 4. or 6-inch stroke; however, any other required length of stroke may be obtained on special order.

BEVERLY

SHEAR

"S-3" Slitting Shears for slitting, cutting and trimming sheet steel or any other material, have compound power transmission, which provides smooth, easy operation. Interchangeable and adjustable blades of high quality tempered and drawn tool steel are firmly held in alignment by the rigid frame to assure clean cutting, regardless of the thickness of metal-up to capacity. Unique adjustable shoe, bearing on upper blade holder. provides additional support, for the upper blade, which increases the strength and cutting efficiency of the Shear.

Slitting capacity 1/8"; trimming 3/16"; bar capacity 1/4" x 2" (capacities given are in mild steel)

Ask your Beverly Dealer for a demonstration or write for full details and illustrated circular.

High Carbon High Chrome Blades for cutting stainless available on special order.





Errington Adjustable Tapping Head

Adjustable Tapping Head

Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y., is now manufacturing a tapping head which permits the operator to take advantage of a wide range of adjustment without overhang. It is fully geared, with needle bearings on all spindles in the head and ball thrust bearings throughout. All parts are fully enclosed for pressure lubrication and protection. Non-

slip positive clamping is said to be provided on all adjusting members.

The Errington Adjustable Tapping Head features a sand-cast aluminum case and is supplied with three spindles for equal adjustment in line and three, four, five, or six spindles for equal adjustment on bolt circles.

GEARS GOOD GEARS ONLY

All Kinds—Any Quantity
AT THE RIGHT PRICE
THE CINCINNATI GEAR CO.

Voester Pike Cincinnati,

Universal Punch Press Pitman

The Dayton Rogers Manufacturing Co., 2824 13th Ave., S., Minneapolis, Minn., now has available a punch press

replacement pitman adaptable to all punch press cranks for definite press overload protection in sizes for press capacities from 25 to 250 tons. This hydraulic overload jack and safety pitman is said to automatically protect the press from all overload during the work cycle. throw bearing including the ram connection, is machined to size and specifications for fitting individual presses.

According to the manufacturer, the hydraulic jack not only protects the press crankshaft and bed frame from damage but can be so calibrat-



Dayton Rogers Universal Punch Press
Pitman

ed as to assure fragile dies used in the press maximum protection. The pitman is designed for quick and easy installation.

Boring Tool Holder

A boring tool holder with eccentric adjustment is being introduced by the Comet Tool Co., 738 Broadway, New York 3, N. Y. According to the manufacturer,



CHUCK IT INSIDE and SAVE MONEY

 Let the SPEEDGRIP PRECISION INTERNAL CHUCK save you money by machining your second operation jobs faster and more accurately—MONEY-BACK guarantee. Layouts made if prints are submitted. Send for descriptive folder today.

SPEEDGRIP CHUCK, INC. 1102 W. Beardsley Ave.



Comet Boring Tool Holder

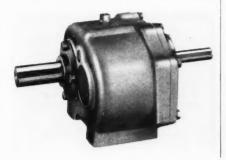
no wrenches or other tools are required for setting up the holder, which is operated entirely by hand. Holes are provided at the end of the collet for inserting a pin to facilitate final, accurate adjustment.

Two-Speed Automatic Transmission

A two-speed automatic transmission which is said to be particularly adapted to machine tool controls but also readily adaptable to all types of special machinery in the chemical, process, service, and other industries is announced by the Western Manufacturing Co., 3400 Scotten Ave., Detroit 10, Michigan.

The mechanism consists of two overrunning clutches, one engaging in a clockwise and the other in a counterclock wise direction, so arranged that by mere ly reversing the motor, two speeds are provided (one at the 1.1 ratio and the other at a preselected reduction) on the output shaft without changing its direction of rotation. The reversing operation is effected by means of a push button,

Western Two-Speed Automatic Transmission





IT'S AN ETTCO KEYLESS DRILL CHUCK

No key is needed! Ettco Drill Chucks are self-tightening. All you do is insert the drill and turn the body by hand — just enough to hold it. Drilling action does the rest, automatically centering the drill and clamping it in a firm and rigid grip.

What's more, it only takes a twist of the body by hand to release the drill.

This keyless feature puts an end to nonproductive time spent in looking for lost keys. It saves time in other ways, too, because it permits drills to be changed in a jiffy and eliminates retightening.

Ettco Drill Chucks are available at leading mill supply houses throughout the country. Order a supply today.

BULLETIN NO. 6 — Free

It gives details and prices of these highquality, precision-made chucks. Write for your copy.

ETTCO TOOL CO. 598 JOHNSON AVE., BROOKLYN 6, N. Y.

DRILL & TAP CHUCKS • TAPPING ATTACHMENTS MULTIPLE DRILLING & TAPPING HEADS DRILLING & TAPPING MACHINES limit or timing switch. In the 5 h.p. model (illustrated) with a 1,750 r.p.m. input, the low limit is a reduction of 6.31 to 1; however, any preselected ratio from 1.1 to this low limit is obtainable.

man St., Rochester 7, N. Y. Available in standard sizes of 24 x 36 and 34 x 44 inches with cotton or plastic neckbands,

Plastic Work Apron

A plastic work apron with electronically sealed edges is being marketed by the Forbes Products Corp., 625 S. Good-



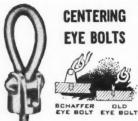
DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD Your business letterhead will bring literature. WATTS BROS. TOOL WORKS Wilmerding, Pa.



Forbes Plastic Work Apron

SCHAFFER LOAD EYE BOLTS



- ★ Carries ten times the load of ordinary Eye Bolt . . . Because it lifts in line with the load!
- Prevents costly damage to machinery, etc., caused by standard eye bolts shearing off.
- * Built to last a lifetime.
- * Parts are easily replaceable.
- Made of high grade steel . . . whose ductility and toughness is greater than ordinary Commercial Steel . . . therefore, SCHAFFER EYE BOLTS can be subjected to heavy intermittent strains and jerks.
- ★ Replaceable Bolts . . . for extra long life.

 7/16" to 3/4" 7/8" to 11/2"

 \$11.75 each \$23.50 each

When ordering specify amount and size.

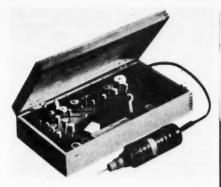
S. S. SCHAFFER COMPANY
1846 East 57th St. • Los Angeles 11, Calif.

the apron is claimed to be extremely tough, resistant to water, alcohol and acids, and flameproof. It can be obtained in transparent, black, or white colors and may be readily cleaned with a damp cloth.

New Kit for Portable Power Tool

The Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Dept. MMS, Chicago 7, Ill., announces that its "Handee" Portable Power Tool is now available in a new, highly polished wooden kit that is much more attractive and practical for





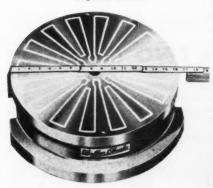
New Kit for "Handee" Portable Power Tool

the user in storing accessories. In addition to housing the tool, the kit accommodates the 40 most popular accessories.

16-Inch Rotary Permanent Magnetic Chuck

The O. S. Walker Co., Inc., Worcester 6, Mass., has announced the standardization of a 16-inch rotary permanent mag-netic chuck which is said to feature uniform lines of force over the entire surface. According to the manufacturer, the chuck employs the exact proportion of Alnico to the mass of iron necessary to polarize the entire surface and, at the same time, to have magnets polarized with equal amounts of force.

Walker Standard 16-Inch Rotary Permanent Magnetic Chuck

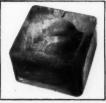


MASH!

HEAT TREATING PROBLEMS

NON SCALING COMPOUND

PHOENIX BRAND NON-SCALING COMPOUND has proved so successful in Parker's own plant, it is now being offered commercially to industry. Not a salt solution but a specially compounded powder for use in hardening and annealing of steels—tested and proven in hundreds of hardening rooms, PHOENIX BRAND NON-SCALING COMPOUND pays its way in time and money saved. Obtain increased furnace capacity and production! Recommended for steels hardening up to 1750° F. and for use in all furnaces except bath type. TRY IT . . . discover for yourself the amazing results obtained in time and money saved using PHOENIX BRAND NON-SCAL-ING COMPOUND.



This unretouched photo

shows clean smooth surface after heat treating using PHOENIX BRAND

NON - SCALING COM-

POUND. You too can

benefit in time and money saved. Eliminate scale,

pitting and decarburiza-

This can be prevented! Note scale, pitting and decarburization . . . a result of normal heat treating. Time can be saved, furnace production increased, costly polishing after heat treating can be virtually eliminated.

> ORDER FROM MILL SUPPLIER OR WRITE TO ADDRESS BELOW

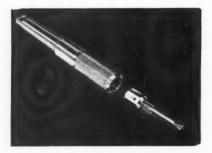
Product of:



THE PARKER STAMP WORKS, Inc. Established 1871 HARTFORD, CONNECTICUT

Tap Chuck

A tap chuck for use on lathes and drill presses in performing occasional power tapping jobs is now being made by the 4 Morse taper shank. It is furnished complete with seven quickly interchangeable adapters in sizes ranging from 8-32 to 14 inch.



Dahlstrom Tap Chuck

Dahlstrom Manufacturing Co., 2522 W. Larpenteur Ave., St. Paul 8, Minn. The design of the chuck permits the tap to float, thereby providing for maximum threading accuracy.

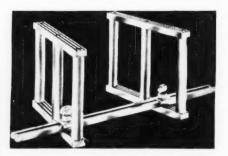
The chuck measures 8% inches long overall and is available with a No. 2, 3, or



Safety Parallel Unit

A safety parallel unit which is claimed to eliminate makeshift methods of supporting tools, dies, jigs, and so on, in performing various operations such as drilling, counterboring, tapping, milling, and grinding is now being manufactured by the Acro Die & Stamping Co., 5328 N. Kedzie Ave., Chicago 25, Ill. The device consists of two parallel units joined together by an adjusting rail with only two thumbscrews to manipulate for quick adjustment of the parallel units to any desired spread.

The Acro Safety Parallel Unit is available in 3, 5 and 7-inch heights with 20-



Acro Heavy Duty Safety Parallel Unit

inch spread, and is hardened and precision ground. The unit is furnished in standard and heavy duty models.





line, sharp-corner filing, sawing and lapping.

• The MILWAUKEE PROFILE GRINDER for high speed, precision grinding of curved and irregular contours.

RICE PUMP & MACHINE CO. Division of Milwaukee Chaplet & Mfg. Co. MILWAUKEE 4, WIS. 1041 S. 40th ST.

PROFILE



Write for Bulletins

New Books

Indentation Hardness Testing. By Vincent E. Lysaght. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. 290 pages. Illustrated. Cloth binding, board covers. Price, \$5.50.

Sufficient information is presented in this book to acquaint the user of hardness testing equipment with the usual problems with which he must cope. No attempt is made to consider hardness in detail from the theoretical standpoint, nor is this volume a complete historical study of the development of the hardness test. Rather, an endeavor is made to describe the hardness testers in common use in the United States and to discuss in detail the problems associated with the use of hardness testing equipment.

Sufficient historical background is presented to acquaint the reader with the development of various instruments. Likewise, sufficient theoretical consideration is given so that the reader may acquire a thorough knowledge of the pres-

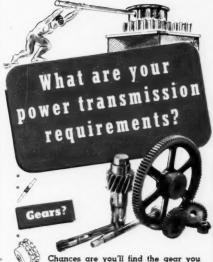
ent status of hardness testing.

Treatise on Powder Metallurgy, Volume I (Technology of Metal Powders and Their Products). By Claus G. Goetzel, Ph.D. Published by Interscience Publishers, Inc., New York. 806 pages, 300 illustrations. 82 Tables. Cloth binding. Price, \$15.00.

The first volume of a library of three written by Dr. Goetzel, this encyclopedic treatment of powder metallurgy presents to the novice, the expert, the development engineer, and the inventor 20 chapters of principles, history, theory, experiment, technology, properties, production, and application. Coverage is so complete that the volume is said to be equally useful as an introductory text, a reference book, a source for new applications, and a stimulus to new developments and new processes.

Patent Law. Second Edition. By Chester H. Biesterfeld. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 267 pages. Cloth binding, board covers. Price, \$4.00.

Intended for researchers, chemists, engineers, patent attorneys, and inventors, this book presents the basic principles of the substantive patent law in terms the general reader can understand. Included is a careful selection from the leading decisions in support of these principles.



want available from Grant's mammoth stock. If not, complete facilities are available to cut all types. Deliveries made on your schedule. Write today for free catalog describing complete line.



Worm, double worm, compound worm and spur, helical, mitre gear — Grant makes them all . . . reductions up to 3660-1 . . . most types available from stock. Write for catalog describing each type in detail.

Special requirements?
... unusual and difficult
jobs are a Grant specialty
... for an estimate write
outlining your problem.

162 W. SECOND ST. SO. BOSTON, MASS.



Proceedings of Fastener Manufacturers' Symposium. Published by American Institute of Bolt, Nut and Rivet Manufacturers, 1550 Hanna Bldg., Cleveland 15, Ohio. 100 pages. Price, \$1.50.

American-British-Canadian unified screw threads as applied to fasteners such as bolts, screws, and nuts is the subject of this book, which contains 13 papers presenting the background of international agreement, a description and analysis of the new standard and its effect on fastener manufacture.

The Cylinder Wear in Diesel Engines. By Carl Hoegh. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 243 pages. Price, \$5.00.

This volume correlates the available data on the subject of cylinder wear in Diesel engines, discusses all factors affecting piston and cylinder wear, and summarizes the proposals for reducing wear and increasing the efficiency of Diesel engines. Piston rings, lubrication, fuel oils, ignition and combustion deposits and abrasives, corrosion material and surface treatment, operating conditions, and types of engines are among the topics treated in the book.

Oxyacetylene Welding and Cutting. Fourth Edition. By Stuart Plumley. Revised and rewritten by T. B. Jefferson. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. 356 pages. Illustrated. Cloth binding, board covers. Price, \$6.50.

This book is designed to fill the need for a concise, easy-to-understand course of instruction in oxyacetylene welding and cutting technique. It begins with basic principles and proceeds, step by step, to show the reader how to develop skill in handling both repair and production work. All types of welding and cutting operations are covered, including pipe-line welding, flame cutting steel and cast iron, brazing, lead welding light metals, bronze welding and brazing, hard facing, boiler and firebox welding, and so on.

"Bibliography on X-Ray Stress Analysis", with subject index, is now being issued by the St. John X-Ray Laboratory, Califon, N. J. Prepared by Herbert R. Isenberger, the bibliography includes 240 references and is available at a price of 3.00 per copy.



Next time try R & N Taps.

Nothing is as convincing as your own experience.

Send us your toughest tapping job. That is the way many leading industries learned what R & N ground from the solid production Taps could do. We guarantee satisfaction. Give R & N a trial and be convinced.

Let us know your tapping problems. Our service engineers will solve them promptly.

REIFF & NESTOR COMPANY

manufacturers of TAPS AND REAMERS

LYKENS, PA.

New Shop Literature

The publications listed in this section may be obtained tree upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning MODERN MACHINE SHOP when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

Production Boring Tools. The Madison Manufacturing Co., Muskegon, Mich., has prepared a 36-page two-color booklet

entitled "Boreaming with Madison Production Tools" which presents descriptions, illustrations, and specifications of rough boring tools, finish boring tools, combination rough boring and finish boring tools, special multiple cutting tools, and special bottoming tools, and special proofs.

Mounted Wheels and Points. The versatility of mounted wheels and points for offhand and precision work, and for grinding in hardto-reach places is described in Folder ESA-67 now being offered by the Simonds Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa. Included are full-size illustrations of these products together with suggested uses and a graphic presenta-tion of the wide range of sizes available, as well as information on grains, grades, operating speeds, and a section giving four easily followed rules for ordering the desired wheels and points.

"Let's Look at Lyon" is the title of a brochure published by Lyon Metal Products, Inc., which contains a series of six 4-page messages which appeared in 1948 in the local newspapers of the two Lyon manufacturing communities (Aurora, Illinois and Chicago Heights, Illinois), the purpose of which was to provide people in these communities with a broader understanding of the overall operations of this materials handling equipment manufacturer.

Limited copies of the brochure are available from Lyon Metal Products,

Inc., Aurora, Illinois.



The unique friction clutch on this new, improved Procunier high speed tapping head practically "thinks" for the operator... making taps last longer, cutting production time and cost. This double-cone clutch engages the drive and reverse shells with a velvety "cushioned" action. Tap driving power is automatically regulated by the amount of pressure applied to it. "Blind" tapping is done as easily as through tapping. The operator can quickly detect dull or "loaded" taps just by the pressure needed to drive them. This increased sensitivity and smoothness results in: fewer broken taps; less operator skill needed, faster, lower cost tapping! This improved Procunier tapping head has many more time and money saving features. Write today.



12 S. CLINTON ST. CHICAGO 6, ILL



Gentlemen:

Please send your illustrated brochures which give complete prices and specifications on Procunier High Speed Tapping Heads and Machines.

Name
Address
City Zone State

PROCUNIER "TAP SAVER"

Exclusive "Tru - Grip" tap holder, lighter, smaller in diameter, minimizes "flywheel" effect. It affords easier tapping close to walls or shoulders, eliminates "chewed up" tap shanks.



Multiple and Light Duty V-Belt Drives. The Mechanical Goods Division, United States Rubber Co., Rockefeller Center, New York 20, N. Y., has published a 100page manual to assist engineers in designing both multiple and light duty Vbelt drives. The manual contains a comprehensive set of drive tables for multiple belts, complete sheave data, including construction details, dimensions, and weights; complete fractional horsepower drive layouts: and comparison tables with information on quarter-turn drives and hexagon double V-drives. Detailed information on U. S. Royal super-service V-belts, U. S. Rainbow steel cord belts. and standard U. S. Rainbow V-belts with equa-tensil cord section is also contained in the manual.

Laps. The Federal Tool Corp., 3600 W. Pratt Blvd., Chicago 45, Ill., is distributing a four-page two-color circular presenting illustrated, descriptive and tabular information, including prices, on its line of "Flexolaps," available in sizes from $\frac{7}{16}$ to $\frac{9}{4}$ inch. Also covered are midget laps for holes under $\frac{1}{16}$ inch in diameter.

15-Inch Shaper, Timken bearing equipped throughout and designed for wide machine shop usage, is fully illustrated and described in an eight-page two-color circular (M4820-S) published by the Western Machine Tool Works, 9th & Lake Sts., Holland, Michigan.

Carbon Steel Wrenches for various industrial applications are described and illustrated in Catalog A-40 announced by J. H. Williams & Co., Buffalo 7, New York.

Hydraulic Surface Grinders for toolrooms and production lines are featured
in an eight-page three-color catalog now
available from The DoAll Co., Desplaines, Ill. Their flexibility and adaptability for a wide variety of work is explained by picturing the construction of
these grinders. The catalog contains specifications and illustrations of six models
which stem from two basic machines
weighing 2,500 and 2,970 lb. The six
models include machines for toolroom,
production, and plunge grinding and a
unique hand grinder which is operated
hydraulically.

HIGH CARBON HIGH SPEED

The Versatile

DELAWARE

CONTROLLED ATMOSPHERE FURNACE
Will Give You

GUARANTEED RESULTS!

Range 1200° - 2800° F.

For descriptive literature, write

DELAWARE TOOL STEEL CORP.

WILMINGTON 99

DELAWARE



Gisholt Model 50 Superfinisher, a general purpose machine designed to handle medium to small cylindrical parts, is illustrated and described in a leaflet now being distributed by the Gisholt Machine Co., Madison 19, Wisconsin.

Ortman-Miller Cylinders for air, hydraulic and water services are featured in a 12-page two-color bulletin issued by the Ortman-Miller Machine Co., Inc., Hammond, Ind. In addition to a cylinder cross-section diagram, the bulletin contains dimensional drawings with corresponding tables on the various models of cylinders. The bulletin also contains a separate price list of the various cylinders.

Hartmann Instant Action Vises. Bulletin No. 201 illustrating a few examples of the many uses where Hartmann Instant Action Vises are designed to save time and motion and cut tooling and production costs has been issued by the Engineering Department, Hartmann Mfg. Co., Dept. MM, 1600 Junction Ave., Racine, Wis. Illustrated are an all-purpose vise for holding parts of varying thickness and a Jawset vise for holding parts of uniform thickness.

Acme Horizontal Hydraulic Broaching Machines, which may be easily set up for a wide variety of internal, keyway and surface broaching jobs, are illustrated and described as to constructional features and advantages in a four-page two-color bulletin issued by the Acme Broach Corp., Milan, Mich. A table listing specifications of the various models of broaching machines is included.

Price Guide Catalog of Lubrication Devices and Seals. A 16-page two-color catalog published by the Gits Bros. Mfg. Co., 1845 S. Kilbourn Ave., Chicago 23, Ill., presents complete data on lubrication devices and seals, including price information, a table of discounts, precise and necessary specifications (body materials, thread sizes, capacities, dimensions, and so on), identifying illustrations, and special announcements highlighting the Gits "Roto-Flex" Shaft Seal and "Unit Seal."



before they start

Trouble on routine tapping jobs can generally be avoided by a little attention before the job starts. Check each of four factors: the piece or material being tapped, the machine and fixtures, the lubrication and the tap itself. The following list indicates the points to check on the lubrication.

CHECK LUBRICATION

- Proper kind of Lubricant?
- Is there enough to flood hole?
- ls it too warm or too dirty?
- Has lubricant sufficient force to wash chips away?
- If applied with brush does it adhere to tap?
- Does Lubricant get to working threads?

Checking each of these points, and the points on the piece, the machine and the tap is bound to start you right on a fast, economical job. Each message of this series lists the points to check on one of the factors.



Sometimes questions or problems arise which require technical analysis. When this occurs, send us complete data: material, depth and diameter of hole, is hole through or blind, type of lubricant being used. Our engineers will be glad to give you a complete analysis and technical recommendations. No obligation, of course.

The Wood 's Spencer Company develound 1. Com

New Holland Kreider Centrifugal Dryer, designed to dry all types of plated parts and small parts, is illustrated and described in a four-page two-color folder issued by the New Holland Machine Co.; New Holland, Pa. Specifications of the dryer, as well as illustrations showing its use, are included in the folder.

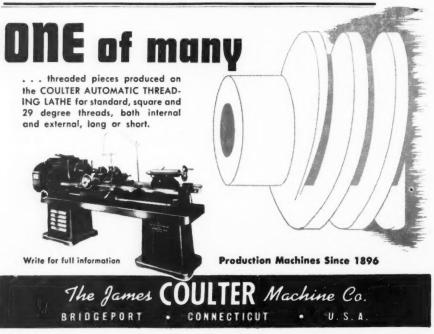
Industrial Gas Burner Equipment. A catalog describing high and low pressure equipment for all common gaseous fuels has been released by the Surface Combustion Corp., Toledo 1, Ohio. Divided into 10 sections and containing over 130 pages, the attractively maroon-bound catalog is designed as a ready reference source for all engineers concerned with the specification and design of gas combustion equipment.

In addition to presenting the more than 60 types of burners in 600 sizes supplied by "Surface," the catalog contains considerable practical data as to the selection of burners for most industrial heating services with the various gaseous fuels. A useful engineering data section on furnace design and heat input requirement calculations is also included in the catalog.

Dresser Guide. A handy 9 x 12-inch wall chart illustrating and explaining the selection and application of grinding wheel dressing tools has been published by the Desmond-Stephan Mfg. Co., Urbana, Ohio. The chart shows various types of dressers for different wheel dressing applications and lists the model and size number of each tool.

Rivett 918 Steelway Lathes are illustrated and described in a six-page two-color bulletin issued by Rivett Lathe & Grinder, Inc., Brighton, Boston, Mass. The folder features a cabinet lathe for toolroom work and a cabinet turret lathe for production operations. A table of specifications covering both types of lathes is included.

Reynolds Screw Driving Machines. A catalog illustrating and describing a complete line of magazine feed power driven screw driving machines is now being distributed by the Cook & Chick Co., 640 S. Miller St., Chicago 7, Ill. Sizes and types suitable for every screw driving application are covered.



Lathe Toolholder. A bulletin descriptive of a toolholder which permits large cuts to be made with small type tools and also allows for multiple cutting is now being distributed by the Rusnok Tool Works, 4840 W. North Ave., Chicago 39, Illinois.

Double Circle Tools. An eight-page two-color circular now being distributed by the Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill., clearly illustrates all of the popular items in the company's line of Dou-

ble Circle tools, which includes drills, reamers, carbide tools, miscellaneous tools, and so on. Respective list numbers are provided.

Cemented Carbide Tool Manual. Intended to answer all possible ques-tions concerning single point carbide tools-how to design them, make them, use them, and so on-a 10section 190-page manual has been published for supervisory personnel by the Carboloy Co., Inc., 11149 E. 8 Mile Rd., Detroit 32, Mich. The principles outlined in the manual can also be applied to multiple form tools. Over 700 photographs and drawings were prepared specifically for the manual. The printed text is separated in such a way that material of primary interest appears in one column, printed in bold face type. Material of secondary or background interest is printed in slightly smaller type in another column. The illustrations appear in the center of each page between the two columns of text, each illustration being next to the text it illustrates and vice versa. The index is set up in the language of and in terms of "questions" concerning carbide tools which the user might have in mind.

The 10 sections of Carboloy Tool Manual No. 191 cover the following subjects: tool design; chip breaker design; grade and speed selection; brazing; tool grinding; chip breaker grinding; application of tools; trouble shooting; inspection of tools; tool control and method selection.



Abrasive Cutoff Machines are illustrated and described in literature now available from The Tabor Manufacturing Co., 6225 Tacony St., Philadelphia 35, Pennsylvania.

Reversible Tungsten Carbide Gages. The Size Control Co., 2500 W. Washington Blvd., Chicago 12, Ill., now has available a catalog (No. 49) on reversible plain and thread plug gages, centerless lapping machines, and a complete line of tungsten carbide and Norbide gages.

Blowers. The Lindberg Engineering Co., 2443, W. Hubbard St., Chicago 12, Ill., has issued a four-page two-color bulletin which presents illustrated, descriptive, and tabular information on centrifugal blowers, combination blower and oil pump units, and V-belt blowers.

"Cost Cutters" is the title of a 12-page two-color bulletin published by The G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio, which illustrates and describes Gray Double Housing and Openside Milling Machines, Double Housing Planers, Openside Planers, Openside Planer Cub, and Horizontal Boring, Drilling and Milling Machines (floor type and planer type).

Universal Cutter and Tool Grinder, described as an ideal unit for the small shop with limited requirements or for the large manufacturing plant where batteries of machines of this type are required, is fully covered in a 12-page bulletin published by the Gallmeyer & Livingston Co., 308 Straight Ave., S. W., Grand Rapids 4, Mich. In addition to illustrating and explaining the construction features of the machine, the bulletin shows and discusses the use of the unit in cutter grinding, face grinding, periphery grinding, corner grinding, spiral cutter grinding, formed cutter grinding, angle cutter grinding, reamer grinding, hob grinding, end mill grinding, gear cutter grinding, cylindrical grinding, internal grinding, and surface grinding. Moreover, the bulletin illustrates and briefly describes another design of universal cutter and tool grinder, hydraulic universal and tool grinder, hydraulic feed surface grinder, double holder motor driven tool grinder, double holder motor driven tap grinder, and combination drill and tap grinders.



PIPE and TUBE CUTTING ... More Cuts per Wheel

Continental Steel Cut-Off Wheels, available for all makes of rotary cut-off machines, provide increased production . . . at modest cost.

Discs 7" dia., 3_{16}^{31} " and $\frac{1}{16}$ " thick carried in stock. Bore 1_{16}^{76} ", $1\frac{1}{2}$ ", or $1\frac{3}{4}$ ". Special sizes made quickly.

Write for folder and prices.

CONTINENTAL MACHINE 1952 MAUD AVE. CHICAGO 14, ILL.

KING BOXES

IMMEDIATE SHIPMENT!



An ideal all-purpose shop box with rigid handle

All Prices F.O.B. Philadelphia Plant

INC. 3015 N. 16TH STREET PHILADELPHIA 32, PA.

Telephone: BAldwin 9-1805



The fact that this good man had the streetcar fare to come to town does not necessarily make him a red hot prospect for a \$150.00 suit.

Some advertising men think that they can separate the "shoppers" from the "buyers" of their product just by advertising it where a "fare" is charged for the magazine.

WHAT THEY DON'T UNDERSTAND IS

that a good medium for their advertising need not cost the reader anything. Readers for your sales message in MODERN MACHINE SHOP are selected on the basis of their ability to buy metal-working products—not on their ability to pay a few

dollars for a magazine subscription.

That's just one reason advertisers get such profitable results from MODERN MACHINE SHOP. RESULTS TELL THE STORY. Gardner Publications, Inc., Cincinnati 2, Ohio.



"Wire Rope Is a Machine" is the title of a 96-page pocket-size handbook published by the Jones & Laughlin Steel Corp., Pittsburgh 30, Pa. Interestingly illustrated, the handbook provides men on the job an unusually simple and straightforward explanation of how wire rope works, how it should be operated, and how to select and order the correct wire rope construction for long service life on the job.

To demonstrate the facts of life about wire ropes, small characters representing animated pieces of wire rope are used in the illustrations. This animation carries through five sections of the handbook. demonstrating important features of (1)

installing and operating wire rope; (2) selecting the correct wire ripe for job; (3) catalog of standard J & L wire rope constructions; (4) standard fittings, slings, and splicing service available with J & L wire rope; and (5) general recommendations for ropes in use on standard equipment. Included in the catalog section are tables of weights and strengths. Vital statistics on rope end attachments are included in the section on standard fittings, slings, and splicing service.

In the section on general recommendations, wire rope constructions used on the following types of equipment are mentioned specifically: shovels, dragline excavators, cranes, grab buckets, trench

hoe, skimmer, paver, scraper and bulldozer, rotary drilling rigs, cable tool drilling rigs, deep mining equipment, industrial equipment, marine equipment and logging rigs. Other illustrations include impressive photography of wire rope applications in each of these industries. Copy of the handbook is available on request to Wire Rope Sales, Jones & Laughlin, Steel Corp., Pittsburgh 30. Pennsylvania.



- Laminated construction has 22% more magnetic surface-to the extreme edge.
- · Holds the tough jobs-large or small.
- Special surface contours available for special jobs . . . custom design to fill your needs.
- Simplicity in operation—rectifiers and demagnetizers available.

ANOTHER HANCHETT FIRST realized because of a necessity and backed by a precision machine tool builders' experience.

Check your shop order - for operations where chucking time cuts into profits. Let us recommend Hanchett Laminated Magnetic chucks to cut operation time in machining any of your parts. Ask for bulletin MM-69.



Hanchett

MAGNA-LOCK CORP.

Magnetic Chucks and Devices BIG RAPIDS, MICHIGAN, U. S. A.

Power Hack Saws. A four-page two-color bulletin released by the Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn., provides illustrated, descriptive and tabular information on eight models of power hack saws designed to meet all cutting requirements up to 6% x 6%-inch capacity.

Weighted-Accumulator Throttle Type High Pressure Hydraulic Valve. The R. D. Wood Co., Public Ledger Bldg., Independence Square, Philadelphia 5, Pa., has issued a four-page data sheet (No. 4901) on its "Protectomatic" Weighted-Accumulator Throttle Valve which is designed to provide a simple and positive means of controlling the falling speed of a weighted-type accumulator.

Microhoning Equipment. The Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich., has published a 12-page two-color catalog presenting illustrations, descriptions, and specifications regarding a line of equipment for generating the final finished accuracy, size, and surface finishes of cylindrical bores and cylindrical parts.

Radial Saw for metal and other materials is fully illustrated and described in a six-page two-color folder (No. 1009) now available from the Walker-Turner Div., Kearney & Trecker Corp., Plainfield, New Jersey.

Air Chucks. The Cushman Chuck Co., Hartford 2, Conn., announces a bulletin detailing the operation and adjustment of air chucks with "Accralock" individual precision jaw adjustment features which provide a means for obtaining accurate positioning of the chuck jaws, as well as for locking the jaws when the exact setting has been made.

Portable Electric Grinder-Miller. Literature covering its Precise Super 40 Portable Electric Grinder-Miller and attachments as to applications, features, specifications, and prices is now being distributed by the Precise Products Co., 1345 Clark St., Racine, Wisconsin.

Remote Control Timing Device. The P&W Synchro Timer, a remote control timing device which is designed to direct or classify or sort almost anything that is produced continuously or that travels on a conveyor mechanism, is fully described and illustrated in a four-page two-color circular (No. 518) released by Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Connecticut.

CASE REPORT No. 52 from a series of actual cases recording the successful application of "BEAR" DV-NAMIC BALANCING to industry.

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"Die Headlines" Vol. III, No. 5, a sixpage publication dealing with unified screw threads and the new proposed American Standards Association publication B1.1 "Unified and American Screw Threads for Screws, Bolts, Nuts and Other Threaded Parts" is now available from The Eastern Machine Screw Corp., 140 Truman St., New Haven 6, Conn.

Rotex Quick Change Punch Press for the rapid punching of various size holes in gauge metal is covered as to available models, specifications, features, and so on, in a four-page two-color folder issued by the Rotex Punch Co., 4726 E. 12th St., Oakland 1. California.

Stainless Steel Mechanical Property Chart. Peter A. Frasse & Co., Inc., 17 Grand St., New York 13, N. Y., has available an informative chart (Sec. A No. 7) on stainless steels which lists typical mechanical properties—tensile strength, yield strength, hardness, and so on—of bars, strip, sheets, plates, and wire in various stages of cold working or heat treating.

Diamond Tools for all industrial purposes are illustrated, described, and priced in a four-page two-color folder issued by Diamonds and Tools, Inc., 19345 John R. St., Detroit 3, Michigan.

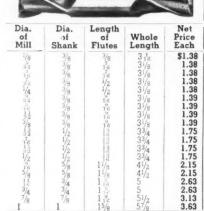
Universal Hand Tapping Machine of heavy duty, wide range design is pictured and described in a four-page two-color bulletin prepared by The Producto Machine Co., 960 Housatonic Ave., Bridgeport 1, Connecticut.

Carbide-Tipped Tools. A 12-page pocket-size two-color folder released by the Super Tool Co., 21650 Hoover Rd., Detroit 13. Mich., describes a line of carbide-tipped tools for turning, boring, facing, and threading. Seven types of stocked tools, both left and right-hand styles, are completely detailed for size and price.

Breuer "Tornado" Industrial Vacuum Cleaners are pictured and described in a four-page two-color folder now being distributed by the Breuer Electric Mfg. Co., 5100 Ravenswood Ave., Chicago 4, Ill.

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"Han-D-Press." A four-page two-color bulletin designed to provide production engineers and executives with detailed information on the operation and use of its new air-operated "Han-D-Press" has been released by the Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill. The press, which is available in ½ to 1-ton sizes, is especially designed for production assembly, staking, pressing, marking, riveting, and other operations.

Hydrostatic Precipitator, intended for the collection and control of dust generated in manufacturing and process operations, is fully illustrated and described as to advantages, available arrangements, features, performance characteristics, and so on, in a 20-page bulletin issued by the American Air Filter Co., Inc., 100 Central Ave., Louisville 8, Ky.

Gage Catalog. An attractive 116-page catalog of fixed gages is announced by The Sheffield Corp., Dayton 1, Ohio. A profusely illustrated handbook of factual and useful information for the buyers and users of perishable gages, the catalog includes prices, complete specifications, diagrams and tables. The information and prices presented on gages is said to conform to the new unified screw thread system recently agreed upon by the English speaking countries using the inch as a standard of measurement.

Landis Tool 4-Inch Type H Plain Hydraulic Cylindrical Grinder, product of the Landis Tool Co., 10 E. Sixth St., Waynesboro, Pa., is illustrated and described in a 16-page two-color catalog published by this firm. Included are 37 illustrations of the machine, its parts, grinding setups, and extra attachments. Complete specifications are also provided.

Bench Millers and Accessories for use in the milling, drilling, sawing, boring, facing, and slotting of small parts are illustrated and described in a four-page three-color folder prepared by The Burke Machine Tool Co., 22 E. 72nd St., Cincinnati 16, Ohio. Covered are two power feed millers and two hand feed millers, as well as various bench miller attachments, including a vertical milling attachment, indexing centers, and vises.

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NUMBERALL STAMP & TOOL CO. HUGUENOT PARK STATEN ISLAND 12, N. Y.

Gear Hobber for the rapid generation of spur, spiral and bevel gears, gear sectors, spline shafts, pinions, and worm gears is described and illustrated in a four-page two-color bulletin (No. H 1-49) published by The Hamilton Tool Co., 828 S. 9th St., Hamilton, Ohio.

Inserted Blade Milling Cutters. A catalog listing sizes, dimensions and prices of a line of inserted blade face mills, end mills, half side and staggered tooth cutters is now being distributed by the McCrosky Tool Corp., Meadville, Pennsylvania.

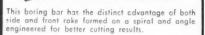
Hydraulic Valves. An 8½ x 11-inch two-color catalog (Section 201) having 52 pages devoted to illustrating and describing over 90 different models of four-way hydraulic valves has been published by the Gerotor May Corp., Dept. MMS, Baltimore 3, Md. The catalog also fully describes 25 models of oil pilot valves for the remote control of main four-way valves. In addition, valves for flow control, shutoff and deceleration, relief, sequence, unloading, and counterbalance are shown.

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Revolving Stops. The Boyar-Schultz Corp., 2120 Walnut St., Chicago 12, Ill., has issued an illustrated circular describing two new sizes of revolving stops for turret lathes and larger type screw machines. The new sizes are No. 4RS (1½-inch shank) and No. 5RS (1¾-inch shank).

Reversible Thread Gage, said to have approximately twice the gaging length of a standard A.G.D. thread gage, is illustrated and described in a four-page two-color circular now being distributed by the Swedish Gage Company of America, 8900 Alpine Ave., Detroit 4, Mich.

Impact Wrench. A four-page folder distributed by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., illustrates and describes a large capacity air impact wrench for studs, bolts, nuts, and cap screws from 1½ up to 2-inch thread size.

Profile-Measuring Microscope. An illustrated bulletin presenting complete details and specifications on a profile-measuring microscope for high precision measuring and the control of profiles on the basis of enlarged drawings is available from the Hauser Machine Tool Corp., Dept. MM, Manhasset, New York.

Low Pressure Cylinders. Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill., has published a 20-page catalog (No. 236) on low pressure cylinders which includes dimensional drawings, construction features and capacities of all standard sizes and presents information on mounting brackets, cylinder cushions, and so on, as well cylinder selection data.

Abrasive Belt Machinery. The standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, announces Bulletin 70 covering a complete line of abrasive belt machinery, including bench and floor models with horizontal backstands, flexible horizontal-vertical backstands, individual wheel heads, and various sizes of spring loaded and air cylinder backstands, as well as a variety of heavy duty polishers and grinders with work rests as required for heavy grinding and snagging with abrasive belts.

Taper Reamers and Boring Bars. Onondaga Tool Corp., Fayetteville, N. Y., has prepared a 16-page catalog (No. 104) which presents illustrated, descriptive, and tabular information on roughing and finishing reamers with S.A.E., Morse, and Brown & Sharpe standard tapers, as well as on high speed boring bars.

Beveled Retaining Rings. Booklet EDR 1001 issued by Waldes Kohinoor, Inc., Truarc Sales Div., 47-16 Austel Pl., Long Island City 1, N. Y., deals with the use of Waldes Truarc Beveled Retaining Rings as a satisfactory means of eliminating end play resulting from accumulated tolerances occurring in various types of machine assemblies.

"One Electrode for All Steel Problems," is the title of a six-page two-color folder published by the Eutectic Welding Alloys Corp., Dept. P. 40 Worth St., New New York 13, N. Y., which fully covers a special all-purpose electrode for alloy steel, cast steel, clad steel, cold rolled steel, manganese steel, stainless steel, tool and die steel, and so on.

Plug Gages. The Standard Gage Co., Inc., Poughkeepsie, N. Y., has published a six-page three-color circular which presents complete information on its Du-Bo Plug Gages for checking a wide variety of bores.

Mist Type Coolant Grinding Attachment for Cincinnati No. 2, cutter and tool grinder is fully illustrated and described in Publication No. M-1672 available from The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

9-Inch Swing Precision Lathe for both heavy roughing and smooth finishing cuts is illustrated, described, and priced in Bulletin No. 906 distributed by the South Bend Lathe Works, 427 E. Madison St., South Bend 22, Indiana.

Precision Boring Machines, available in both single and double-end types, for boring, turning, and facing operations are described and illustrated in a six-page two-color bulletin (No. 11-44) issued by the Covel Mfg. Co., Benton Harbor, Michigan.



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Dresser Attachments. A series of attachments which enable J & S Fluidmotion dressers to be adapted to practically every type of grinding machine is pictured and described in a leaflet issued by the J & S Tool Co., Inc., 475 Main St., East Orange, New Jersey.

32 and 64-Drawer Cabinets for the storage of nails, screws, nuts, bolts, washers, small parts, stamps, and numerous other items are illustrated and described in a two-color leaflet now available from Kaytee Products, Dept. 15, Box 588, Canton, Ohio.

Carbide Tools and Products. A 66-page plastic-bound catalog published by the Willey's Carbide Tool Co., 1342 W. Vernor Highway, Detroit 1, Mich., presents complete data, including prices, on a line of carbide tools and products involving centerless grinder work support blades, boring bars, broaches, centers, milling cutters, dies, drills, gage bushings, gages, mandrels, face mills, end mills, reamers, saws, tips, cutoff tools, turning tools, and so on. Data are also presented on diamond tools and mechanical dressers.

Surface Grinder, product of the Jakobsen Tool Co., 224 Glenwood Ave., Bloomfield, N. J., is covered as to construction features, specifications, applications, and so on, in a four-page folder now available from this firm.

Taper Attachment. A bulletin now available free from the Master Taper Co., 4531 N. Beacon St., Chicago 40, Ill., illustrates and describes a taper attachment designed for all lathes with from 9 to 24-inch swing.

"Success Stories from the Brief Case of a Natco Field Engineer" is the title of a folder issued by the National Automatic Tool Co., Richmond, Ind., which provides a colorful, dramatic presentation of actual case histories of possible savings with multi-drilling, tapping, boring, and facing machines. The brief case type folder is made of heavy paper to act as a convenient file folder for future Natco Success Stories.

Cutter Grinder. A 16-page two-color bulletin (GG-251) issued by The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, presents complete data on the Le-Blond No. 2 Cutter Grinder for toolroom use.

"Angle Inspection" is the title of a four-page two-color bulletin released by the Webber Gage Co.. 12900 Triskett Rd., Cleveland 11, Ohio, illustrating and describing Webber Angle Gage Blocks, including their use in angle measurement. Clear diagrams show how a set of 16 angle blocks yield 356,400 angles in steps of one second, and illustrations indicate how the angle blocks can be wrung together to inspect a variety of angles in degrees, minutes, and seconds.

Shop Tools. A two-color envelope-size folder (CP93) released by The Billings and Spencer Co., Hartford 1, Conn., describes and illustrates a line of shop tools, including clamps for welders, machinists, body builders, and for heavy duty work; lathe dogs for the machine shop; chain pipe vises for steam fitters, oil field workers, maintenance men, and so on; all-steel and offset screw drivers; ball pein hammers; adjustable and non-adjustable spanners for spindle bearing work and other large dimensional uses.

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11/16"	15	12	8.25	1"	20	15	16.00
23/32"	15	12	8.50	1-1/16"	20	15	17.00
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together to obtain a combination of given measurements; (7) "How DoAll Gages Are Used," a 35 mm. sound-slide film with records which has a showing time of 18 minutes and covers methods of using laboratory, inspection, and work gage blocks; (8) "DoAll Precision Accuracy with the DoAll Inspection Laboratory," a 35 mm. sound-slide film with records which has a showing time of 28 minutes and demonstrates industrial use of precision measuring instruments to acquire accuracy to four millionths of an inch.

The films are available on a free loan basis for showing at engineering society meetings, schools, and industrial plants. For large audiences, DoAll engineers will participate as speakers and to demonstrate machine tool equipment.

Abell-Howe Cranes and Monorails. A 12-page two-color catalog now being issued by the Abell-Howe Co., 53 W. Jackson Blvd., Chicago 4, Ill., illustrates and describes a complete line of overhead handling equipment, including cranes, jibs, monorails, and accessories. Copy free upon request.

Lincoln Weldirectory for Hard Surfacling is now being distributed by The Lincoln Electric Co., Cleveland 1, Ohio. The bulletin includes a preface to arc weld surfacing, a guide for the selection of Lincoln hard surfacing electrodes, and a description of these various electrodes, including typical applications. Copy of Bulletin 466 free upon request.

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How "Triple C" Plan Helps Federal-Mogul Corporation Maintain Leadership

A PIONEER in various forms of efficiency in quality production, Federal-Mogul is one of many large companies who are using Carboloy's "Triple C" plan of coordinated carbide control to help beat the trend towards high break-even points caused by rising costs.

Essentially, the plan is one of coordination of all phases of carbide use within a plant, under the direct supervision of a carbide supervisor.

Under the "Triple C" plan, design, application, and maintenance of carbide tools are standardized wherever possible; grinding, purchasing, inventory control, and handling are coordinated by a carbide coordinator.



J. L. Wood, Plant Manager of the Detroit Branch, Federal-Mogul Corporation, manufacturers of bearings noted for exceptional precision and quality, says: "A Coordinated Carbide Control program is important to the maintenance of an advantageous position in a highly competitive field."



Under "Triple C", Federal-Mogul has developed 3500 form tools. Of these 80% are ground from six inexpensive standard Carboloy single-point tools and one standard blank! The seven standards are shown below; above are a few of the form tools developed from them.



Here are a few of the benefits reported by Federal-Mogul:

Advantages of central responsibility:

- Greater utilization of carbide tools
- · Organized training of personnel in carbide methods
- Immediate, expert assistance with carbide problems
- Constant inspection of carbide tools by carbide specialists
- Recognition of causes of poor performance or carbide breakage

Advantages of central stock:

- Drastically reduced carbide tool inventory
- Extensive standardization of carbide tools
- More efficient salvage and re-use of worn or broken tools
- Greater economies in special tools

Advantages of central grinding:

- · Less grinding equipment needed
- · Lower inventory of expensive grinding wheels
- · Expert, specialized grinding of all carbide tools
- · Longer carbide tool life
- · Elimination of grinding by machine operators
- · Less idle machine time

These benefits are typical. Wherever the plan has been adopted, similar savings in time and costs have been achieved . . . plus, of course, the amazing increases in production that extensive use of carbides brings to any manufacturing operation! The odds are ten to one that the plan can do as much for your company.

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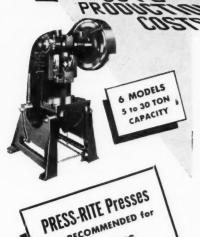
Pneumatic Abrasive Tools. Bulletin No. 819 issued by the Chicago Pneumatic Tool Co., 8 E. 44th St., New York 17, N. Y., contains descriptions, detailed specifications, and application views of a line of pneumatic grinders, sanders, files, wire brush machines, and accessories. The bulletin also shows a variety of special purpose tools such as reciprocating files, rod grinders, and external tube and polishers. Copy free upon request.

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Over the Editor's Desk

Why All The Mystery?

SINCE the Automobile Workers' Union demanded, some years ago, that the automobile manufacturers open their books to inspection by the unions, there has been a great deal of controversy as to whether or not the figures on the amount of business transacted, costs, profits, and so on, were the private business of the company or whether the employees were justified in claiming that this information was part of their business also.

As a matter of fact, a number of American manufacturers have made a practice for years of taking their employees into their confidence periodically, and have laid this information before them either in meetings or by means of letters sent to the employees' homes. The MacWhyte Company, Kenosha, Wisconsin, holds an annual meeting of the entire organization at which time a number of charts representing the financial situation of the company are set up on a platform and the business transactions of the previous year are explained to the organization. These charts show the ratio between profits and taxes, the manner in which the income dollar is divided to meet costs and expenses, and so on. Many other companies do substantially the same thing, and with excellent results so far as employee relations is concerned.

Last year a machine tool manufacturer in Hartford, Connecticut, was closed down in a bitter strike which lasted for twenty weeks. The union saw figures in the company's annual report which indicated that it had a ten million dollar surplus. Immediately jumping to the conclusion that this surplus was money in the bank, the union demanded a 15¢ an hour raise. Much to the union's surprise, the president of the company asked the union if it would like to have its committee look at the company's books. The union agreed, and after poring over the books, they found that the millions that they thought available for raises was somewhere else—invested in designing and tooling new models for the market, and in other forms of inventory. The union agreed that surplus in this form spells job security for its members, and withdrew its demand for the wage increase.

This matter of whether or not a company should open its books for inspection by its employees should not prove a difficult obstacle to hurdle. After all, how much real difference does it make if a firm's competitors learn how much business a firm did in

a given period and how much money it made? The annual reports of most firms are available to anyone interested, and the amount of dividends paid is listed in the stock market report in the newspapers. The only other important figure is the figure representing net profit after all expenses, taxes, and allowance for depreciation have been met, and if the company is doing an honest job of serving and not gouging its customers, there should be no hesitancy about disclosing this figure to the company's employees.

The relation between employees and management should be as close and free and confidential as it is possible to make it. Weeds and tares have a hard time sprouting in a field that is properly cultivated, and the employe who has been taken into the confidence of his employers concerning the standing of the firm's product in the field, the markets, competition, material costs, service expense, sales expense, overhead, and so on, will have a better appreciation of his task and a finer sense of loyalty to his firm than the worker who is allowed, through neglect, to feel that he is simply a cog in a machine over which he has no control.

The stockholders of a company, the company officials, and the members of the manufacturing organization are united in a common purpose—to perform a service to the public through the creation and distribution of a product for which there is a demand and thus justify the firm's existence. If more firms will take their employees into their confidence and acquaint them with more of the details of the operation of the business, it is very likely that there will be less friction between management and employees.

Howard Campbug



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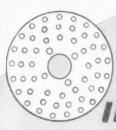
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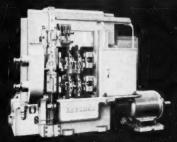
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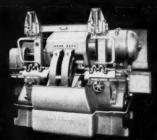
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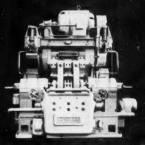
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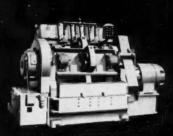
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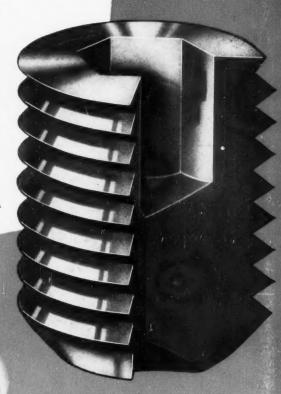
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- 5. STEEL H.K special analysis heat-
- 6. INSPECTION Each H-K Socket Screw is individually inspected before leaving the factory.

RESULT - GUARANTEED UNFAILING PERFORMANCE.

H-K Distributors are always ready to serve you from their warehouse stock.



THE HOLO-KROME SCREW CORP. HARTFORD 10, CONN.